### University Core and Graduation Requirements

#### University Core Requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
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<tbody>
<tr>
<td>Religion Cornerstones</td>
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<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
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<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
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<td>2.0</td>
<td>REL A 250</td>
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<tr>
<td>Foundations of the Restoration</td>
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<td>2.0</td>
<td>REL C 225</td>
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<tr>
<td>The Eternal Family</td>
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<td>REL C 200</td>
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<tr>
<td>The Individual and Society</td>
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<td></td>
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</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>
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<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Skills</td>
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<tr>
<td>First Year Writing</td>
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<tr>
<td>Advanced Written and Oral Communications</td>
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<tr>
<td>Quantitative Reasoning</td>
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<tr>
<td>Languages of Learning (Math or Language)</td>
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<tr>
<td>Arts, Letters, and Sciences</td>
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<tr>
<td>Civilization 1</td>
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<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
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<td>from approved list</td>
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<tr>
<td>Arts</td>
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<td>Letters</td>
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<td>from approved list</td>
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<td>Physical Science</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td>Social Science</td>
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<td>3.0</td>
<td>from approved list</td>
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<td>Core Enrichment: Electives</td>
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<td>Religion Electives</td>
<td>3-4</td>
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<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
</tbody>
</table>

#### Graduation Requirements:

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

### Suggested Sequence of Courses

#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>15.0</td>
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<tr>
<td>2nd</td>
<td>15.0</td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Total Hours</th>
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<tbody>
<tr>
<td>3rd</td>
<td>14.0</td>
</tr>
<tr>
<td>4th</td>
<td>16.0</td>
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</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td>14.0</td>
</tr>
<tr>
<td>6th</td>
<td>15.0</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th</td>
<td>16.0</td>
</tr>
<tr>
<td>8th</td>
<td>16.0</td>
</tr>
</tbody>
</table>

**BS in Computer Science: Data Science (693224) MAP Sheet**

Physical and Mathematical Sciences, Computer Science

For students entering the degree program during the 2019-2020 curricular year.
# BS in Computer Science: Data Science (693224)
## 2019-2020 Program Requirements (74 Credit Hours)

**Grades below C- are not allowed in major courses.**

### REQUIREMENT 1 Complete 11 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 312 - Algorithm Design and Analysis 3.0
- C S 324 - Systems Programming 3.0
- C S 404 - Ethics and Computers in Society 2.0
- C S 452 - Database Modeling Concepts 3.0
- C S 472 - Introduction to Machine Learning 3.0
- C S 474 - Introduction to Deep Learning 3.0

### REQUIREMENT 2 Complete 4 courses
- ENGL 316 - Technical Communication 3.0
- MATH 112 - Calculus 1 4.0
- MATH 113 - Calculus 2 4.0
- PHSCS 121 - Introduction to Newtonian Mechanics 3.0

### REQUIREMENT 3 Complete 1 option
- **OPTION 3.1** Complete 1 course
  - MATH 313 - (Not currently offered)
- **OPTION 3.2** Complete 2 courses
  - MATH 213 - Elementary Linear Algebra 2.0
  - MATH 215 - Computational Linear Algebra 1.0

### REQUIREMENT 4 Complete 1 course
- STAT 121 - Principles of Statistics 3.0
- STAT 201 - Statistics for Engineers and Scientists 3.0

### REQUIREMENT 5 Complete 1 course
- ECON 388 - Introduction to Econometrics 3.0
- STAT 330 - Introduction to Regression 3.0

### REQUIREMENT 6 Complete 3.0 hours from the following course(s)
- C S 412 - Linear Programming and Convex Optimization 3.0
- ECON 378 - Statistics for Economists 3.0
- ECON 388 - Introduction to Econometrics 3.0
- ECON 588 - Advanced Econometrics 3.0
- LING 581 - Natural Language Processing 3.0
- MATH 314 - Calculus of Several Variables 3.0
- MATH 413 - Advanced Linear Algebra 3.0
- STAT 240 - Probability and Inference 1 3.0
- STAT 251 - Introduction to Bayesian Statistics 3.0

### REQUIREMENT 7 Complete 12.0 hours from the following course(s)
**NOTE: C S 494/495, THE CAPSTONE COURSES, ARE STRONGLY RECOMMENDED.**
- C S 252 - Introduction to Computational Theory 3.0
- C S 329 - Testing, Analysis, and Verification 3.0
- C S 330 - Concepts of Programming Languages 3.0
- C S 340 - Software Design and Testing 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 401R - Topics in Computer Science 3.0
  - You may take up to 12 credit hours.
- C S 418 - Bioinformatics 3.0
- C S 450 - Computer Vision 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 470 - Introduction to Artificial Intelligence 3.0
- C S 486 - Verification and Validation 3.0
- C S 494 - Capstone 1 3.0
- C S 495 - Capstone 2 3.0
- C S 497R - Undergraduate Research 3.0
  - You may take this course up to 1 time.
- C S 501R - Topics in Computer Science 3.0
  - You may take up to 12 credit hours.

**Note: Students can take C S 401R or C S 501R more than once.**

**Note: Total hours for C S 497R across all requirements cannot exceed 6.0.**

**Note: If C S 494 or 495 are chosen in Requirements 7 or 8, students should complete the sections designated for the Data Science emphasis.**

### REQUIREMENT 8 Complete 3.0 hours from the following course(s)
**NOTE: COURSES TAKEN TO FULFILL REQUIREMENTS 4 AND 5 CANNOT DOUBLE COUNT HERE.**
- C S 252 - Introduction to Computational Theory 3.0
- C S 329 - Testing, Analysis, and Verification 3.0
- C S 330 - Concepts of Programming Languages 3.0
- C S 340 - Software Design and Testing 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 401R - Topics in Computer Science 3.0
  - You may take up to 3 credit hours.
- C S 418 - Bioinformatics 3.0
- C S 450 - Computer Vision 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 470 - Introduction to Artificial Intelligence 3.0
- C S 486 - Verification and Validation 3.0
- C S 494 - Capstone 1 3.0
- C S 495 - Capstone 2 3.0
- C S 497R - Undergraduate Research 3.0
  - You may take this course up to 1 time.
- C S 501R - Advanced Topics in Computer Science 3.0
  - You may take up to 3 credit hours.

**Note: Math 112, Math 113, Phscs 121, Engr 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: Engr 316. Quantitative Reasoning: Math 112 or 113. Languages of Learning: Math 112 or 113. Physical Science: C S 312 or Phscs 121.**

### REQUIREMENT 9
Complete Senior Exit Interview with the Computer Science department during last semester or term.

**Note: Math 112, Math 113, Phscs 121, Engr 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: Engr 316. Quantitative Reasoning: Math 112 or 113. Languages of Learning: Math 112 or 113. Physical Science: C S 312 or Phscs 121.**
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