# University Core and Graduation Requirements

## University Core Requirements:

### Religion Cornerstones
- Teachings and Doctrine of The Book of Mormon
  - Classes: 1
  - Hours: 2.0
  - Class: REL A 275
- Jesus Christ and the Everlasting Gospel
  - Classes: 1
  - Hours: 2.0
  - Class: REL A 250
- Foundations of the Restoration
  - Classes: 1
  - Hours: 2.0
  - Class: REL C 225
- The Eternal Family
  - Classes: 1
  - Hours: 2.0
  - Class: REL C 200

### The Individual and Society
- American Heritage
  - Classes: 1-2
  - Hours: 3-6.0
  - From approved list
- Global and Cultural Awareness
  - Classes: 1
  - Hours: 3.0
  - From approved list

### Skills
- First Year Writing
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Advanced Written and Oral Communications
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Quantitative Reasoning
  - Classes: 1
  - Hours: 4.0
  - From approved list
- Languages of Learning (Math or Language)
  - Classes: 1
  - Hours: 4.0
  - From approved list

### Arts, Letters, and Sciences
- Civilization 1
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Civilization 2
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Arts
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Letters
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Biological Science
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Physical Science
  - Classes: 1
  - Hours: 3.0
  - From approved list
- Social Science
  - Classes: 1
  - Hours: 3.0
  - From approved list

### Core Enrichment: Electives
- Religion Electives
  - Classes: 3-4
  - Hours: 6.0
  - From approved list
- Open Electives
  - Classes: Variable
  - Hours: Variable
  - Personal choice

## Graduation Requirements:
- Minimum residence hours required: 30.0
- Minimum hours needed to graduate: 120.0

## Suggested Sequence of Courses

### FRESHMAN YEAR
- **1st Semester**
  - C S 142: 3.0
  - First-year Writing or American Heritage: 3.0
  - MATH 112: 4.0
  - Religion Cornerstone course: 2.0
  - General education, university requirements, and/or general electives: 3.0
  - **Total Hours**: 15.0
- **2nd Semester**
  - C S 202: 1.0
  - C S 235: 3.0
  - PHSCS 121: 3.0
  - First-year Writing or American Heritage: 3.0
  - MATH 113: 4.0
  - Religion Cornerstone course: 2.0
  - **Total Hours**: 16.0

### SOPHOMORE YEAR
- **3rd Semester**
  - C S 203: 1.0
  - C S 224: 3.0
  - C S 236: 3.0
  - Biological Science: 3.0
  - Civilization 1: 3.0
  - Religion Cornerstone course: 2.0
  - **Total Hours**: 15.0
- **4th Semester**
  - C S 240: 4.0
  - C S 260 or other C S elective: 3.0
  - MATH 213: 2.0
  - MATH 215: 1.0
  - Civilization 2: 3.0
  - Religion Cornerstone course: 2.0
  - **Total Hours**: 15.0

### JUNIOR YEAR
- **5th Semester**
  - C S 204: 1.0
  - C S 312: 3.0
  - C S 324: 3.0
  - Social Science: 3.0
  - STAT 121, STAT 201, or MATH 431: 3.0
  - Religion Elective: 2.0
  - **Total Hours**: 15.0
- **6th Semester**
  - C S 329: 3.0
  - C S 340: 3.0
  - C S 452: 3.0
  - Letters: 3.0
  - Religion Elective: 2.0
  - **Total Hours**: 14.0

### SENIOR YEAR
- **7th Semester**
  - C S 494: 3.0
  - C S Elective: 3.0
  - ENGL 316: 3.0
  - Arts: 3.0
  - Religion Elective: 2.0
  - General education, university requirements, and/or general electives: 2.0
  - **Total Hours**: 16.0
- **8th Semester**
  - C S 495: 3.0
  - C S Elective: 3.0
  - C S Elective: 3.0
  - C S 404: 2.0
  - Global and Cultural Awareness: 3.0
  - **Total Hours**: 14.0
BS in Computer Science: Software Engineering (693225)  
2019-2020 Program Requirements (74 - 76 Credit Hours)

Grades below C- are not allowed in major courses.

**REQUIREMENT 1** Complete 16 courses

**CORE COURSES:**
- C S 142 - Introduction to Computer Programming 3.0
- C S 202 - Software Engineering Lab 1 1.0
- C S 203 - Software Engineering Lab 2 1.0
- C S 204 - Software Engineering Lab 3 1.0
- 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 329 - Testing, Analysis, and Verification 3.0
- C S 340 - Software Design and Testing 3.0
- C S 404 - Ethics and Computers in Society 2.0
- C S 452 - Database Modeling Concepts 3.0
- C S 494 - Capstone 1 3.0
- C S 495 - Capstone 2 3.0

**SUPPORTING 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 2 courses**

- C S 260 - Web Programming 3.0
- C S 330 - Concepts of Programming Languages 3.0
- C S 345 - Operating Systems Design 3.0

**REQUIREMENT 6 Complete 2 courses**

COURSES WILL NOT DOUBLE COUNT BETWEEN REQUIREMENT 4 AND REQUIREMENT 5.

- C S 252 - Introduction to Computational Theory 3.0
- C S 260 - Web Programming 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 401R - Topics in Computer Science 3.0
- C S 405 - Creating and Managing a Software Business 3.0
- C S 412 - Linear Programming and Convex Optimization 3.0
- 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 472 - Introduction to Machine Learning 3.0
- C S 474 - Introduction to Deep Learning 3.0
- C S 486 - Verification and Validation 3.0
- C S 493R - Undergraduate Research 3.0
- C S 498R - Undergraduate Special Projects 3.0
- C S 501R - Advanced Topics in Computer Science 3.0
- C S 513 - Robust Control 3.0
- EC EN 424 - Computer Systems 4.0
- EC EN 425 - Real-Time Operating Systems 4.0
- IT&C 567 - Cybersecurity and Penetration Testing 3.0
- MATH 411 - Numerical Methods 3.0
- MATH 431 - Designing the User Experience 3.0
- MATH 485 - Mathematical Cryptography 3.0

**Note:** If C S 493R, C S 498R, or C S 501R is chosen, it must be taken for 3 credit hours.

**REQUIREMENT 7**

Complete Senior Exit interview with the C S department during last semester or term.

**Note:** Math 112, Math 113, Phscs 121, Engl 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: Engl 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