### University Core Requirements:

#### Religion Cornerstones
- Teachings and Doctrine of The Book of Mormon
- Jesus Christ and the Everlasting Gospel
- Foundations of the Restoration
- The Eternal Family

#### Skills
- First Year Writing
- Advanced Written and Oral Communications
- Quantitative Reasoning
- Languages of Learning (Math or Language)

#### The Individual and Society
- American Heritage
- Global and Cultural Awareness

#### Arts, Letters, and Sciences
- Civilization 1
- Civilization 2
- Arts
- Letters
- Biological Science
- Physical Science
- Social Science

#### Core Enrichment: Electives
- Religion Electives
- Open Electives

### 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 111: 3.0
  - First Year Writing or American Heritage: 3.0
  - MATH 112: 4.0
  - Religion Cornerstone course: 2.0
  - Total Hours: 15.0

- 2nd Semester
  - 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: 15.0

#### SOPHOMORE YEAR
- 3rd Semester
  - C S 224: 3.0
  - C S 236: 3.0
  - Biological Science: 3.0
  - STAT 121 or STAT 201 or MATH 431: 3.0
  - Religion Cornerstone course: 2.0
  - Total Hours: 14.0

- 4th Semester
  - C S 240: 4.0
  - Letters: 3.0
  - Civilization 1: 3.0
  - MATH 213: 2.0
  - Religion Cornerstone course: 2.0
  - Total Hours: 15.0

#### JUNIOR YEAR
- 5th Semester
  - C S 312: 3.0
  - C S 324: 3.0
  - STAT 330 or ECON 388: 3.0
  - Social Science: 3.0
  - Civilization 2: 3.0
  - Total Hours: 15.0

- 6th Semester
  - C S 472: 3.0
  - C S 452: 3.0
  - DS Elective: 3.0
  - C S Elective: 3.0
  - Religion Elective: 2.0
  - Total Hours: 14.0

#### SENIOR YEAR
- 7th Semester
  - C S 474: 3.0
  - C S 494 - DS Capstone 1 or CS elective: 3.0
  - WRTG 316: 3.0
  - Arts: 3.0
  - General education courses, university requirements, and/or general electives: 2.0
  - Religion Elective: 2.0
  - Total Hours: 16.0

- 8th Semester
  - C S 495 - DS Capstone 2 or C S elective: 3.0
  - C S Elective or DS elective: 3.0
  - C S Elective: 3.0
  - C S 404: 2.0
  - Global and Cultural Awareness: 3.0
  - Religion Elective: 2.0
  - Total Hours: 16.0
**BS in Computer Science: Data Science (693224)**

**2022-2023 Program Requirements (74 Credit Hours)**

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

**REQUIREMENT 1 Complete 12 courses**
- CS 101 - Introduction to Computer Science
  - 3.0
- CS 105 - Introduction to Data Science
  - 3.0
- CS 224 - Introduction to Computer Systems
  - 3.0
- CS 235 - Data Structures and Algorithms
  - 3.0
- CS 236 - Discrete Structures
  - 3.0
- CS 240 - Advanced Programming Concepts
  - 4.0
- CS 312 - Algorithm Design and Analysis
  - 3.0
- CS 324 - Systems Programming
  - 3.0
- CS 404 - Ethics and Computers in Society
  - 2.0
- CS 452 - Database Modeling Concepts
  - 3.0
- CS 472 - Introduction to Machine Learning
  - 3.0
- CS 474 - Introduction to Deep Learning
  - 3.0

**REQUIREMENT 2 Complete 4 courses**
- STAT 240
  - 3.0
- MATH 314
  - 3.0
- LING 581
  - 3.0
- ECON
  - 3.0
- ECON 388
  - 3.0
- ECON 378
  - 3.0
- C S 412
  - 3.0
- C S 474
  - 3.0
- C S 452
  - 3.0
- C S 324
  - 3.0
- C S 312
  - 3.0
- C S 180
  - 3.0
- C S 111
  - 3.0

**REQUIREMENT 3 Complete 1 option**
- MATH 112 - Calculus 1
  - 4.0
- MATH 113 - Calculus 2
  - 4.0
- PHYS 121 - Introduction to Newtonian Mechanics
  - 3.0
- *WRTG 316 - Technical Communication
  - 3.0

**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 220 - Statistical Modeling for Data Science
  - 3.0
- STAT 330 - (Not currently offered)
  - 3.0

**REQUIREMENT 6 Complete 3.0 hours from the following course(s)**
- STAT 251 - Introduction to Bayesian Statistics
  - 3.0
- STAT 340 - Probability and Inferenc 2
  - 3.0

**REQUIREMENT 7 Complete 9.0 hours from the following course(s)**

**NOTE: C S 482/483, THE DATA SCIENCE CAPSTONE COURSES, ARE STRONGLY RECOMMENDED.**

- C S 252 - Introduction to Computational Theory
  - 3.0
- C S 320 - Web Programming
  - 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
  - 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
  - 3.0v
  - You may take up to 3 credit hours.
- C S 412 - Linear Programming and Convex Optimization
  - 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 471 - Voice User Interfaces
  - 3.0
- C S 481 - Data Science Capstone 1
  - 3.0
- C S 483 - Data Science Capstone 2
  - 3.0
- C S 488 - Verification and Validation
  - 3.0
- C S 497R - Undergraduate Research
  - 3.0v
  - You may take this course up to 1 time.
- C S 501R - Advanced Topics in Computer Science
  - 3.0v
  - You may take up to 3 credit hours.
- C S 513 - Robust Control
  - 3.0
- C S 580 - Theory of Predictive Modeling
  - 3.0
- ECON 378 - Statistics for Economists
  - 3.0
- ECON 388 - Introduction to Econometrics
  - 3.0
- ECON 488 - (Not currently offered)
  - 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 Inferenc 1
  - 3.0

**REQUIREMENT 8 Complete 3.0 hours from the following course(s)**

**NOTE: COURSES TAKEN TO FULFILL REQUIREMENT 5 CANNOT DOUBLE COUNT HERE.**

- C S 412 - Linear Programming and Convex Optimization
  - 3.0v
- ECON 378 - Statistics for Economists
  - 3.0
- ECON 388 - Introduction to Econometrics
  - 3.0
- ECON 488 - (Not currently offered)
  - 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 Inferenc 1
  - 3.0

**REQUIREMENT 9 Complete 12 courses**

**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.**

**REQUIREMENT 10 Complete 3.0 hours from the following course(s)**

**NOTE: COURSES TAKEN TO FULFILL REQUIREMENTS 5, 6, AND 7 CANNOT DOUBLE COUNT HERE.**

- C S 252 - Introduction to Computational Theory
  - 3.0
- C S 320 - Web Programming
  - 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
  - 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
  - 3.0v
  - You may take up to 3 credit hours.
- C S 412 - Linear Programming and Convex Optimization
  - 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 471 - Voice User Interfaces
  - 3.0
- C S 481 - Data Science Capstone 1
  - 3.0
- C S 483 - Data Science Capstone 2
  - 3.0
- C S 488 - Verification and Validation
  - 3.0
- C S 497R - Undergraduate Research
  - 3.0v
  - You may take this course up to 1 time.
- C S 501R - Advanced Topics in Computer Science
  - 3.0v
  - You may take up to 3 credit hours.
- C S 513 - Robust Control
  - 3.0
- C S 580 - Theory of Predictive Modeling
  - 3.0
- ECON 378 - Statistics for Economists
  - 3.0
- ECON 388 - Introduction to Econometrics
  - 3.0
- ECON 488 - (Not currently offered)
  - 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 Inferenc 1
  - 3.0
- STAT 251 - Introduction to Bayesian Statistics
  - 3.0
- STAT 340 - Probability and Inferenc 2
  - 3.0

**REQUIREMENT 11 Complete Senior Exit Interview with the Computer Science department during last semester or term.**

**Note:** Math 112, Math 113, Phsccs 121, Engi 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: Engi 316. Quantitative Reasoning: Math 112 or 113. Languages of Learning: Math 112 or 113. Physical Science: C S 312 or Phsccs 121.
BS in Computer Science: Data Science (693224)
2022-2023 Program Requirements Cont...

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