

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

Physical and Mathematical Sciences, Computer Science

For students entering the degree program during the 2022-2023 curricular year.



University Core and Graduation Requirements				Suggested Sequence of Courses					
<b>University Core Requirements:</b>				<b>FRESHMAN YEAR</b>			<b>JUNIOR YEAR</b>		
<b>Requirements</b>	<b>#Classes</b>	<b>Hours</b>	<b>Classes</b>	<b>1st Semester</b>		<b>5th Semester</b>			
<b>Religion Cornerstones</b>				C S 111	3.0	C S 312	3.0		
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	First Year Writing or American Heritage	3.0	C S 324	3.0		
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250	MATH 112	4.0	STAT 330, Stat 220, or ECON 388	3.0		
Foundations of the Restoration	1	2.0	REL C 225	General education courses, university requirements, and/or general electives	3.0	Social Science	3.0		
The Eternal Family	1	2.0	REL C 200	Religion Cornerstone course	2.0	Civilization 2	3.0		
<b>The Individual and Society</b>				<b>Total Hours</b>	<b>15.0</b>	<b>Total Hours</b>	<b>15.0</b>		
American Heritage	1-2	3-6.0	from approved list	<b>2nd Semester</b>		<b>6th Semester</b>			
Global and Cultural Awareness	1	3.0	from approved list	C S 235	3.0	C S 472	3.0		
<b>Skills</b>				CS 180	3.0	C S 452	3.0		
First Year Writing	1	3.0	from approved list	First Year Writing or American Heritage	3.0	PHSCS 121	3.0		
Advanced Written and Oral Communications	1	3.0	WRTG 316	MATH 113	4.0	Elective	3.0		
Quantitative Reasoning	1	4.0	MATH 112* or 113*	Religion Cornerstone course	2.0	Religion Elective	2.0		
Languages of Learning (Math or Language)	1	4.0	MATH 112* or 113*	<b>Total Hours</b>	<b>15.0</b>	<b>Total Hours</b>	<b>14.0</b>		
<b>Arts, Letters, and Sciences</b>				<b>SOPHOMORE YEAR</b>			<b>SENIOR YEAR</b>		
Civilization 1	1	3.0	from approved list	<b>3rd Semester</b>		<b>7th Semester</b>			
Civilization 2	1	3.0	from approved list	C S 224	3.0	C S 474	3.0		
Arts	1	3.0	from approved list	C S 224	3.0	C S 482 - DS Capstone 1 or CS elective	3.0		
Letters	1	3.0	from approved list	C S 236	3.0	WRTG 316	3.0		
Biological Science	1	3.0	from approved list	Biological Science	3.0	Arts	3.0		
Physical Science	1	3.0	from approved list	STAT 121 or STAT 201 or MATH 431	3.0	C S Elective	3.0		
Social Science	1	3.0	from approved list	Religion Cornerstone course	2.0	Religion Elective	2.0		
<b>Core Enrichment: Electives</b>				<b>Total Hours</b>	<b>14.0</b>	<b>Total Hours</b>	<b>17.0</b>		
Religion Electives	3-4	6.0	from approved list	<b>4th Semester</b>		<b>8th Semester</b>			
Open Electives	Variable	Variable	personal choice	C S 240	4.0	C S 483 - DS Capstone 2 or C S elective	3.0		
<b>Graduation Requirements:</b>				Letters	3.0	C S Elective or DS elective	3.0		
Minimum residence hours required		30.0		Civilization 1	3.0	C S Elective	3.0		
Minimum hours needed to graduate		120.0		MATH 213	2.0	C S 404	3.0		
				MATH 213	1.0	Global and Cultural Awareness	2.0		
				Religion Cornerstone course	2.0	Religion Elective	3.0		
				<b>Total Hours</b>	<b>15.0</b>	<b>Total Hours</b>	<b>16.0</b>		

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

<b>Grades below C- are not allowed in major courses.</b>		STAT 251 - Introduction to Bayesian Statistics	3.0	C S 340 - Software Design	3.0
<b>REQUIREMENT 1</b> Complete 12 courses		STAT 340 - Probability and Inference 2	3.0	C S 345 - Operating Systems Design	3.0
C S 111 - Introduction to Computer Science	3.0	<b>REQUIREMENT 7</b> Complete 9.0 hours from the following course(s)		C S 355 - Interactive Graphics and Image Processing	3.0
C S 180 - Introduction to Data Science	3.0	<b>NOTE: C S 482/483, THE DATA SCIENCE CAPSTONE COURSES, ARE STRONGLY RECOMMENDED.</b>			
C S 224 - Introduction to Computer Systems	3.0	C S 252 - Introduction to Computational Theory	3.0	C S 356 - Designing the User Experience	3.0
C S 235 - Data Structures and Algorithms	3.0	C S 260 - Web Programming	3.0	C S 393 - Advanced Algorithms and Problem Solving	3.0
C S 236 - Discrete Structures	3.0	C S 329 - Testing, Analysis, and Verification	3.0	C S 401R - Topics in Computer Science	3.0v
C S 240 - Advanced Programming Concepts	4.0	C S 330 - Concepts of Programming Languages	3.0	<i>You may take up to 3 credit hours.</i>	
C S 312 - Algorithm Design and Analysis	3.0	C S 340 - Software Design	3.0	C S 412 - Linear Programming and Convex Optimization	3.0
C S 324 - Systems Programming	3.0	C S 345 - Operating Systems Design	3.0	C S 450 - Computer Vision	3.0
C S 404 - Ethics and Computers in Society	2.0	C S 355 - Interactive Graphics and Image Processing	3.0	C S 453 - Fundamentals of Information Retrieval	3.0
C S 452 - Database Modeling Concepts	3.0	C S 356 - Designing the User Experience	3.0	C S 455 - Computer Graphics	3.0
C S 472 - Introduction to Machine Learning	3.0	C S 393 - Advanced Algorithms and Problem Solving	3.0	C S 456 - Introduction to User Interface Software	3.0
C S 474 - Introduction to Deep Learning	3.0	C S 401R - Topics in Computer Science	3.0v	C S 460 - Computer Communications and Networking	3.0
<b>REQUIREMENT 2</b> Complete 4 courses		<i>You may take up to 3 credit hours.</i>			
MATH 112 - Calculus 1	4.0	C S 450 - Computer Vision	3.0	C S 462 - Large-Scale Distributed System Design	3.0
MATH 113 - Calculus 2	4.0	C S 453 - Fundamentals of Information Retrieval	3.0	C S 465 - Computer Security	3.0
PHSCS 121 - Introduction to Newtonian Mechanics	3.0	C S 455 - Computer Graphics	3.0	C S 470 - Introduction to Artificial Intelligence	3.0
*WRTG 316 - Technical Communication	3.0	C S 456 - Introduction to User Interface Software	3.0	C S 471 - Voice User Interfaces	3.0
<b>REQUIREMENT 3</b> Complete 1 option		C S 460 - Computer Communications and Networking	3.0	C S 482 - Data Science Capstone 1	3.0
<b>OPTION 3.1</b> Complete 1 course		C S 462 - Large-Scale Distributed System Design	3.0	C S 483 - Data Science Capstone 2	3.0
MATH 313 - (Not currently offered)		C S 465 - Computer Security	3.0	C S 486 - Verification and Validation	3.0
<b>OPTION 3.2</b> Complete 2 courses		C S 470 - Introduction to Artificial Intelligence	3.0	C S 497R - Undergraduate Research	3.0
MATH 213 - Elementary Linear Algebra	2.0	C S 471 - Voice User Interfaces	3.0	<i>You may take this course up to 1 time.</i>	
MATH 215 - Computational Linear Algebra	1.0	C S 482 - Data Science Capstone 1	3.0	C S 501R - Advanced Topics in Computer Science	3.0v
<b>REQUIREMENT 4</b> Complete 1 course		C S 483 - Data Science Capstone 2	3.0	<i>You may take up to 3 credit hours.</i>	
STAT 121 - Principles of Statistics	3.0	C S 486 - Verification and Validation	3.0	C S 513 - Robust Control	3.0
STAT 201 - Statistics for Engineers and Scientists	3.0	C S 497R - Undergraduate Research	3.0	C S 580 - Theory of Predictive Modeling	3.0
<b>REQUIREMENT 5</b> Complete 1 course		<i>You may take this course up to 1 time.</i>			
ECON 388 - Introduction to Econometrics	3.0	C S 501R - Advanced Topics in Computer Science	3.0v	ECON 378 - Statistics for Economists	3.0
STAT 220 - Statistical Modeling for Data Science	3.0	<i>You may take up to 3 credit hours.</i>			
STAT 330 - Statistical Modeling 2		C S 513 - Robust Control	3.0	ECON 388 - Introduction to Econometrics	3.0
<b>REQUIREMENT 6</b> Complete 3.0 hours from the following course(s)		C S 580 - Theory of Predictive Modeling	3.0	ECON 488 - (Not currently offered)	
<b>NOTE: COURSES TAKEN TO FULFILL REQUIREMENT 5 CANNOT DOUBLE COUNT HERE.</b>		<b>Note: Students can take C S 401R or C S 501R more than once.</b>			
C S 412 - Linear Programming and Convex Optimization	3.0	<b>Note: Total hours for C S 497R across all requirements cannot exceed 6.0.</b>			
ECON 378 - Statistics for Economists	3.0	<b>REQUIREMENT 8</b> Complete 3.0 hours from the following course(s)		<b>REQUIREMENT 9</b>	
ECON 388 - Introduction to Econometrics	3.0	<b>NOTE: COURSES TAKEN TO FULFILL REQUIREMENTS 5, 6, AND 7 CANNOT DOUBLE COUNT HERE.</b>		Complete Senior Exit Interview with the Computer Science department during last semester or term.	
ECON 398 - Applied Econometrics	3.0	C S 252 - Introduction to Computational Theory	3.0	<b>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.</b>	
ECON 588 - Advanced Econometrics	3.0	C S 260 - Web Programming	3.0		
LING 581 - Natural Language Processing	3.0	C S 329 - Testing, Analysis, and Verification	3.0		
MATH 314 - Calculus of Several Variables	3.0	C S 330 - Concepts of Programming Languages	3.0		
MATH 413 - Advanced Linear Algebra	3.0				
STAT 240 - Probability and Inference 1	3.0				

## **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  
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#### **ADVISEMENT CENTER INFORMATION**

##### **Physical and Mathematical Sciences College Advisement Center**

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