

Computational Data Science, B.S.

The Computational Data Science Degree develops strong interdisciplinary skills in mathematics, statistics, computer science and big data processing. Create algorithms, write code and scripts to solve problems beyond the basic use of existing tools in support of an industrial, enterprise-level big data pipeline. The mix of competencies and experiences required for Data Science differs significantly from those developed in the individual degree programs in the four areas mentioned above. Gain real-world experience as a springboard to working in industry as a Data Scientist or to pursue a graduate degree.

Program Requirements

Code	Title	Credit Hours
Total Credit Hours		121
General Education Requirements		35 Credits
ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC Literacies and Composition Across Contexts CC	3
ENGL 2010	Intermediate Academic Writing CC	3
MATH 1210	Calculus I QL *	4
American Institutions: Complete one of the following:		3
HIST 1700	American Civilization AS (3)	
HIST 1740	US Economic History AS (3)	
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
PHIL 2050	Ethics and Values IH	3
Complete the following:		
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE Fitness for Life TE	2
Distribution Courses:		
COMM 1020	Public Speaking HH *	3
COMM 2110	Interpersonal Communication SS *	3
Biology (Choose from list)		3
Fine Arts Distribution (Choose from list)		3
PHYS 2210 & PHYS 2215	Physics for Scientists and Engineers I PP and Physics for Scientists and Engineers I Lab *	5
Discipline Requirements		86 Credits
Complete one of the following GE course/lab combinations:		5
BIOL 1610 & BIOL 1615	College Biology I BB and College Biology I Laboratory (5)	
CHEM 1210 & CHEM 1215	Principles of Chemistry I PP and Principles of Chemistry I Laboratory (5)	
PHYS 2020 & PHYS 2025	College Physics II PP and College Physics II Lab (5)	
PHYS 2220 & PHYS 2225	Physics for Scientists and Engineers II PP and Physics for Scientists and Engineers II Lab (5)	
Minimum grade of C- required in these courses:		
Computer Science		
Complete one of the following:		6
CS 1400 & CS 1410	Fundamentals of Programming and Object Oriented Programming (6)	
CS 1420	Accelerated Introduction to Programming (undefined) (and an additional 3 credit CS elective not already completed) ¹	

CS 2420	Introduction to Algorithms and Data Structures	3
CS 2300	Discrete Mathematical Structures I	3
CS 2450	Software Engineering WE	3
CS 2700	Causal Inference	3
CS 3100	Data Privacy and Security	3
CS 3520	Database Theory	3
CS 3270	Python Software Development	3
CS 3310	Analysis of Algorithms	3
CS 3530	Data Management For Data Sciences	3
CS 3800	Data Science Through Statistical Reasoning	3
CS 3810	Applied Data Science	3
CS 3820	Visualization Analytics for Data Science	3
CS 305G	Global Social and Ethical Issues in Computing GI WE	3
CS 4700	Machine Learning I	3
CS 4710	Machine Learning II	3
CS 4800	Data Science Capstone WE	3
Mathematics		
MATH 1220	Calculus II	4
MATH 2210	Calculus III	4
MATH 2270	Linear Algebra	3
Statistics		
STAT 2050	Introduction to Statistical Methods	4
Elective Requirements:		
Complete 12 credits from any of the following (A minimum grade of C- is required):		12
4 courses from another discipline, at least 6 hours of which must be 3000 level or higher. Requires department head approval.		
Any CS 3000 or 4000 level course not already required		

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If students choose CS 1420, please see advisor.

Graduation Requirements

1. Completion of a minimum of 121 semester credits, with a minimum of 40 upper-division credits.
2. Overall grade point average of 2.0 or above.
3. Must have a minimum grade of C- with a combined GPA of 2.5 or higher in all discipline requirements and the General Education requirements that are marked with an *.
4. Residency hours - - minimum of 30 credit hours through course attendance at UVU. 10 of these hours must be within the last 45 hours earned. At least 12 of the credit hours earned in residence must be in approved Computational Data Science (CDS) courses.
5. All transfer credit must be approved in writing by UVU.
6. No more than 80 semester hours and no more than 20 hours in CDS-type courses of transfer credit from a two-year college.
7. No more than 30 semester hours may be earned through independent study and/or extension classes.
8. Successful completion of at least one Global/Intercultural course. CS 305G satisfies this requirement.
9. Successful completion of at least two Writing Enriched courses.

Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (<http://www.uvu.edu/wolverinetrack/>).

First Year

Semester 1		Credit Hours
MATH 1210	Calculus I QL	4
CS 1400	Fundamentals of Programming	3
STAT 2050	Introduction to Statistical Methods	4

ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC or Literacies and Composition Across Contexts CC	3
Credit Hours		14
Semester 2		
MATH 1220	Calculus II	4
CS 1410	Object Oriented Programming	3
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
ENGL 2010	Intermediate Academic Writing CC	3
Credit Hours		15
Second Year		
Semester 3		
CS 2300	Discrete Mathematical Structures I	3
CS 2420	Introduction to Algorithms and Data Structures	3
MATH 2210	Calculus III	4
Biology Distribution		3
American Institutions		3
Credit Hours		16
Semester 4		
MATH 2270	Linear Algebra	3
CS 2450	Software Engineering WE	3
CS 2700	Causal Inference	3
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE or Fitness for Life TE	2
Third Science Distribution		5
Credit Hours		16
Third Year		
Semester 5		
CS 3270	Python Software Development	3
CS 3310	Analysis of Algorithms	3
CS 3520	Database Theory	3
COMM 2110	Interpersonal Communication SS	3
CDS Elective		3
Credit Hours		15
Semester 6		
CS 3530	Data Management For Data Sciences	3
CS 3800	Data Science Through Statistical Reasoning	3
CS 3820	Visualization Analytics for Data Science	3
Fine Arts Distribution		3
CDS Elective		3
Credit Hours		15
Fourth Year		
Semester 7		
CS 3100	Data Privacy and Security	3
CS 3810	Applied Data Science	3
CS 4700	Machine Learning I	3
PHIL 2050 or PHIL 205G	Ethics and Values IH or Ethics and Values IH GI	3
CDS Elective		3
Credit Hours		15
Semester 8		
CS 4800	Data Science Capstone WE	3
CS 4710	Machine Learning II	3
CS 305G	Global Social and Ethical Issues in Computing GI WE	3
COMM 1020	Public Speaking HH	3
CDS Elective		3
Credit Hours		15
Total Credit Hours		121

Program Learning Outcomes

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.