Computational Data Science, B.S.

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Requirements

The BS in Computational Data Science develops strong interdisciplinary skills in mathematics, statistics, computer science, and big data processing. The program teaches how to create algorithms and 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. Students will gain real-world experience as a springboard to working in industry as a data scientist or to pursue a graduate degree.

Total Program Credits: 121

General Education Requirements:			35 Credits
	ENGL 1010	Introduction to Academic Writing	3
or	ENGH 1005	Literacies and Composition Across Contexts (5)	
	ENGL 2010	Intermediate Writing Academic Writing and Research	3
	MATH 1210	Calculus I	4
American Institutions: Complete one of the following:			3
	HIST 1700	American Civilization (3)	
	HIST 1740	US Economic History (3)	
	HIST 2700	US History to 1877 (3)	
and	HIST 2710	US History since 1877 (3)	
	POLS 1000	American Heritage (3)	
	POLS 1100	American National Government (3)	
Complete the following:			
	PHIL 2050	Ethics and Values	3
	HLTH 1100	Personal Health and Wellness (2)	
or	EXSC 1097	Fitness for Life	2
Distribution Courses:			
	COMM 1020	Public Speaking *	3
	COMM 2110	Interpersonal Communication *	3
	Biology (choose from list)		3
	Fine Arts Distribution (choose from list)		3
	PHYS 2210	Physics for Scientists and Engineers I *	4
and	PHYS 2215	Physics for Scientists and Engineers I Lab*	1
Discipline Requirements:			74 Credits
Complete one of the following GE course/lab combinations:			5
	BIOL 1610	College Biology I (4)	
and	BIOL 1615	College Biology I Laboratory (1)	
or	CHEM 1210	Principles of Chemistry I (4)	
and	CHEM 1215	Principles of Chemistry I Laboratory (1)	
or	PHYS 2020	College Physics II (4)	
and	PHYS 2025	College Physics II Lab (1)	
or	PHYS 2220	Physics for Scientists and Engineers II (4)	
and	PHYS 2225	Physics for Scientists and Engineers II Lab (1)	
Minimum grade of C- required in these courses.			
Computer Science			
	CS 1400	Fundamentals of Programming	3
	CS 1410	Object-Oriented Programming	3
	CS 2300	Discrete Mathematical Structures I	3
	CS 2420	Introduction to Algorithms and Data Structures	3
	CS 2700	Causal Inference	3
	CS 305G	Global Social and Ethical Issues in Computing	3
	CS 3100	Data Privacy and Security	3
	CS 3270	Python Software Development	3

	CS 3320	Numerical Software Development	3
	CS 3520	Database Theory	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 4700	Machine Learning I	3
	CS 4710	Machine Learning II	3
	CS 4800	Data Science Capstone	3
Mathematics			
	MATH 1220	Calculus II	4
	MATH 2210	Calculus III	4
	MATH 2270	Linear Algebra	3
Statistics			
	ECE 3710	Applied Probability and Statistics for Engineers and Scientists	3
	STAT 2050	Introduction to Statistical Methods	4
Elective Requirements:			12 Credits
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		

Graduation Requirements:

1. Completion of a minimum of 120 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 thatare 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.

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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.

Milestone courses (pre-requisites for a course in one of the subsequent semesters) are marked in red and Italicized.

Semester 1	Course Title	Credit Hours
CS 1400	Fundamentals of Programming	3
ENGL 1010 or ENGH 1005	Introduction to Academic Writing or Literacies and Composition Across Contexts	3
MATH 1210	Calculus I	4
STAT 2050	Introduction to Statistical Methods	4
	Semester total:	14
Semester 2	Course Title	Credit Hours
CS 1410	Object-Oriented Programming	3
ENGL 2010	Intermediate Writing Academic Writing and Research	3
MATH 1220	Calculus II	4
PHYS 2210	Physics for Scientists and Engineers I	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
	Semester total:	15
Semester 3	Course Title	Credit Hours
CS 2300	Discrete Mathematical Structures I	3
CS 2420	Introduction to Algorithms and Data Structures	3
MATH 2210	Calculus III	4
GE	Choose from American Institutions distribution list	3
GE	Choose from Biology Distribution list	3
	Semester total:	16
Semester 4	Course Title	Credit Hours
CS 3520	Database Theory	3
MATH 2270	Linear Algebra	3
CS 2700	Causal Inference	3
GE	Choose from HLTH 1100 or EXSC 1097	2
GE	Third Science Distribution	5
	Semester total:	16
Semester 5	Course Title	Credit Hours
CS 3530	Data Management for Data Sciences	3
CS 3270	Python Software Development	3
ECE 3710	Applied Probability and Statistics for Engineers and Scientists	3
COMM 2110	Interpersonal Communication	3
CDS Elective		3
	Semester total:	15
Semester 6	Course Title	Credit Hours
CS 3800	Data Science Through Statistical Reasoning	3
CS 3320	Numerical Software Development	3
CS 3820	Visualization Analytics for Data Science	3
GE	Choose from Fine Arts Distribution list	3
CDS Elective		3
	Semester total:	15
Semester 7	Course Title	Credit Hours
CS 3810	Applied Data Science	3
CS 4700	Machine Learning I	3
CS 3100	Data Privacy and Security	3
PHIL 2050 or PHIL 205G	Ethics and Values	3
CDS Elective		3
	Semester total:	15
Semester 8	Course Title	Credit Hours
CS 4800	Data Science Capstone	3
CS 4710	Machine Learning II	3
CS 305G	Global Social and Ethical Issues in Computing	3
COMM 1020	Public Speaking	3
CDS Elective		3
	Semester total:	15
	Degree total:	121