

Data Science, BS

Program Description

The Bachelor of Science in Data Science combines the computing, mathematical, and statistical skills necessary for modern fundamental data-oriented tasks including data processing, analysis, and presentation. Students will engage in data-driven decision making across various interdisciplinary contexts using computationally intensive approaches. After building a strong core of computing fundamentals including knowledge of data structures and algorithms, students will learn to build custom solutions to solve complex problems using skills such as: data acquisition, management, and governance; probability, statistics, modeling, and machine learning; as well as software construction and data visualization.

Program Curriculum

120 credits

Utah Tech General Education Requirements

All Utah Tech General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to Utah Tech's minimum General Education standards in American Institutions, English, and Mathematics.

Code	Title	Hours
General Education Core Requirements (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)		
	English	3-7
	Mathematics	3-5
	American Institutions	3-6
	Life Sciences	3-10
	Physical Sciences	3-5
	Fine Arts	3
	Literature/Humanities	3
	Social & Behavioral Sciences	3
	Exploration	3-5

Code	Title	Hours
Data Science Core Requirements		
CS 1400	Fundamentals of Programming	3
CS 1410	Object Oriented Programming	3
CS 2420	Introduction to Algorithms and Data Structures	3
CS 2450	Software Engineering	3
CS 2500	Data Wrangling	3
CS 2810	Computer Organization and Architecture	3
CS 3005	Programming in C++	3
CS 3310	Discrete Mathematics	3
CS 3410	Distributed Systems	3
CS 3510	Algorithms	3
CS 4300	Artificial Intelligence	3
CS 4307	Database Systems	3
CS 4320	Machine Learning	3
CS 4400	Data Mining	3
CS 4410	Data Visualization	3
CS 4600	Senior Project	3
MATH 1210	Calculus I (MA)	4
MATH 1220	Calculus II (MA)	4
MATH 2270	Linear Algebra	3

MATH 3400	Probability & Statistics	3
IT 1500	Cloud Fundamentals	1

Code	Title	Hours
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Data Science Elective Requirements

ANY 3000 Upper Division Electives to add up to 40 upper division credits	4
ANY 1000 Open Electives to add up to 120 total credits	10

Code	Title	Hours
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Interdisciplinary Electives (Choose 1 Set of Courses)

ACCT 2010	Financial Accounting (and)	3
FIN 3150	Managerial Finance I	3
OR		
BIOL 1610	Principles of Biology I (LS) (and)	4
BIOL 1615	Principles of Biology I Lab (LAB) (and)	1
BIOL 3030	Principles of Genetics (and)	3
BIOL 3300	Introduction to Bioinformatics	3
OR		
CHEM 1210	Principles of Chemistry I (PS) (and)	4
CHEM 1215	Principles of Chemistry I Lab (LAB) (and)	1
CHEM 1220	Principles of Chemistry II (and)	4
CHEM 1225	Principles of Chemistry II Lab (and)	1
CHEM 3000	Quantitative Chemical Analysis (and)	3
CHEM 3005	Quantitative Chemical Analysis Laboratory	1
OR		
COMM 2110	Interpersonal Communication (SS, GC) (and)	3
COMM 3200	Community Health Communication (and)	3
COMM 4115	Communicating in Close Relationships	3
OR		
ECON 2010	Micro Economics (SS, GC) (and)	3
ECON 3010	Managerial Economics	3
OR		
ENVS 1210	Introduction to Environmental Science (and)	3
ENVS 1215	Introduction to Environmental Science Laboratory (and)	1
ENVS 2700R	Field Methods in Environmental Science	1
OR		
GEO 1010	Introduction to Geology (PS) (and)	3
GEO 1015	Introduction to Geology Lab (LAB) (and)	1
GEO 2700R	Field Methods in Geoscience Research	1
OR		
HLTH 4010	Biostatistics & Epidemiology	3
OR		
MATH 4800	Industrial Careers in Mathematics	3
OR		
PSY 1010	General Psychology (SS, GC) (and)	3
PSY 2000	Writing in Psychology: APA Style (and)	3
PSY 3000	Statistical Methods/Psychology	4
OR		
RSM 3210	Sports Information Strategies (and)	3
RSM 4100	Financial Management in Recreation and Sport	3
OR		

SOC 1010	Introduction to Sociology (SS, GC) (and)	3
SOC 3112	Social Statistics	3

Graduation Requirements

1. Complete a minimum of 120 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at Utah Tech for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C or higher in each Core Requirement and Elective Requirement course.

1st Year

Fall Semester	Hours	Spring Semester	Hours
CS 1400		3 CS 1410	3
MATH 1210		4 MATH 1220	4
ENGL 1010		3 ENGL 2010	3
General Education Physical Science 1000		3 General Education Life Science 1000	3
ELEC 1000		1 General Education SOC 1000	3
		14	16

2nd Year

Fall Semester	Hours	Spring Semester	Hours
CS 2420		3 CS 2450	3
CS 2810		3 CS 2500	3
MATH 2270		3 MATH 2280	3
IT 1500		1 General Education EXPL 1000	3
General Education Fine Arts 1000		3 General Education HUM 1000	3
ELEC 1000		2	
		15	15

3rd Year

Fall Semester	Hours	Spring Semester	Hours
MATH 3400		3 CS 3410	3
CS 3005		3 CS 3510	3
CS 3310		3 General Education American Institution 1000	3
CS 4300		3 Interdisciplinary Elective	3
Interdisciplinary Elective Prereq.		3 ELEC 1000	3
		15	15

4th Year

Fall Semester	Hours	Spring Semester	Hours
CS 4400		3 CS 4307	3
CS 4410		3 CS 4320	3
MATH 3500		3 CS 4600	3
ELEC 1000		3 ELEC 3000	3
ELEC 3000		3 ELEC 3000	3
		15	15

Total Hours 120

BS Data Science Program Learning Outcomes

At the successful conclusion of this program, students will be able to:

1. Prepare and analyze large amounts of data in a compute-efficient manner.
2. Interpret complex problems across heterogeneous datasets using compute-intensive solutions.
3. Determine and apply ethical, legal, and social responsibilities in all aspects of practice.

4. Construct effective solutions in teams to accomplish a common goal.
5. Express effective visual, oral, and written communication for a range of audiences.