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.

General Education Core Requirements (catalog.utahtech.edu/programs/generaleducation/#gerequirementstext)

Code	Title	Hours
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

Code	Title	Hours
Data Science Core Requirements		
CS 1400	Fundamentals of Programming	3
CS 1410	Object Oriented Programming	3
CS 2100	Discrete Structures	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 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
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
Interdisciplinary Electives (Choose 1 Set of Courses)		
ACCT 2010	Principles of Accounting I (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	Communication in Romantic Relationships	3
OR		
ECON 2010	Micro Economics (SS, GC) (and)	3
ECON 3010	Managerial Economics	3
OR		
ENVS 1210	Principles of Environmental Science (and)	3
ENVS 1215	Principles of Environmental Science Laboratory (and)	1
ENVS 2700R	Field Methods in Environmental Science	1
OR		
GEO 1110	Physical Geology (PS)	3
GEO 1115	Physical Geology Lab (LAB)	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 Elective	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 2100	3	CS 3510	3
CS 3005	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.