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New Program Proposal

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Viewing: : Data Science Certificate

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Changes proposed by: Ren Quinn (D00171908)

Proposal Action

Effective Catalog

2024-2025

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Type of Program

Undergraduate Certificate

Program Credit hours defined by USHE:

Institutional Certificate < 16 Credits

Major

Data Science

Emphasis

Department

Computing

College

College of Science, Engineering & Technology

CIP Code

110701 - Computer Science.

Catalog Program Title

Data Science Certificate

Banner Program Title

Data Science Certificate

Banner Program Code

Program Rationale

Many Computer Science (CS) students have an interest in Data Science (DS) but would still prefer to not fully commit to the DS program. While a minor in DS would be valuable for CS students, it is too similar to the CS program to justify. However, a Data Science certificate would still allow students to extend their focus of studies. In essence, a DS certificate would encourage CS students to take DS courses and use them as CS electives in their graduation plan.

Method of Instruction

Traditional

Will this Program have external review or accreditation

No

Program Learning Outcomes

Data Science Certificate 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. Express effective visual, oral, and written communication for a range of audiences.

The Degree Requirements field must include: Program course requirements, program description, admissions requirements, and graduation requirements for proper integration with the catalog.

Degree Requirements

DATA SCIENCE CERTIFICATE REQUIREMENTS

15 Credits

Course List

Code	Title	Hours
CS 2500	Data Wrangling	3
CS 4300	Artificial Intelligence	3
CS 4320	Machine Learning	3
CS 4400	Data Mining	3
CS 4410	Data Visualization	3

Completion Requirements

1. Complete all coursework with a C- or higher
2. Cumulative GPA of 2.5 or higher

Graduation Plan (Degree Map)

n/a

Explain fit within University Mission, Core Themes, and Values

“Utah Tech University is an open, inclusive, comprehensive, polytechnic university featuring active and applied learning to advance students’ knowledge and skills while fostering competent, resilient, lifelong learners to succeed in their careers and personal lives as creators, innovators, and responsible citizens.” The proposed degree supports and implements the mission and core themes of Utah Tech University, including:

Open Education. The field of data science is dedicated to uncovering information in large

datasets. This naturally embodies transparency. Furthermore, it is a practical field that is best taught with real-world case studies and using the predominant tools of the field, including, but not limited to, Python, NumPy, Pandas, Sci-Kit Learn, Tensorflow, Keras, D3.js, and Matplotlib; all of which are free and open source and thus are inclusive and accessible.

Inclusive. Cross-disciplinary topics such as Data Science have been shown to be more inclusive. Additionally, studying diverse datasets exposes students to a wide variety of problems such as social inequity. This not only better informs students of inclusivity challenges but also empowers them to act in overcoming such challenges.

Data Science is also inherently inclusive as it is built on an ecosystem of free and open-source resources such as its development tools and textual references. Additionally, these resources are minimal and entirely digital; students participating in any of our computing-based degrees need only a laptop for equipment. This also makes the program accessible to persons with a disability.

Comprehensive polytechnic. As previously mentioned, Data Science is naturally integrated with other disciplines. It is a practical implementation of Computer Science and Statistics focused on answering questions in real datasets using real tools, regardless of the field of study. This program will provide students with opportunities to work with many real datasets with the exact tools used by professionals and follow the same processes as professionals. Students will be tasked to acquire their own datasets from outside sources and apply these practices to extract patterns, correlations, and other insights from the datasets.

Program Fees

No

Will this program affect enrollments of other UT programs or involve courses taken in different departments

No