

Master of Science

Data Science and Analytics with a Concentration in Full Stack (MS)

This program will provide students with a foundation to use state-of-the-art programming tools and software packages, and includes the flexibility to explore the application of tools and methods across disciplines. Students will learn how to use data for identifying trends and patterns, solving problems, communicating results, and recommending optimal solutions.

Coursework for the full stack concentration provides the flexibility for students to take courses on a wide variety of Data Science topics, and includes electives from a variety of subject areas. Graduates will be able to enter data science, analytical, and statistical fields. This program is available on-campus and online.

Full Stack

In this concentration, students will prepare to enter rapidly emerging fields related to data science and analytics. The coursework addresses relevant data analytics topics such as text analytics, visualization, algorithms and data structures, and information retrieval. Students will learn computational data analysis, data visualization, and natural language processing. Students will select four courses in consultation with the faculty advisor.

Admission

The requirements for admission to the Master of Science in Data Science and Analytics are as follows:

1. A baccalaureate degree in computer science, electrical and/or computer engineering, mathematics, statistics, information system & technology, or a related field from a regionally-accredited institution or an equivalent institution outside the U.S.; students holding a bachelor's degree in an unrelated field will need competency in topics related to basic statistics and computer science.
2. Current scores on the Test of English as a Foreign Language (TOEFL) of at least 230 on the computer based TOEFL or 79 on the TOEFL iBT, or IELTS 6.5 overall.

Students with previously completed work at a regionally-accredited institution may submit a request for a maximum of 12 elective graduate credit hours to be transferred into the program. If approved by the admission committee, it will be added to the transcript.

Curriculum Requirements

The program requires 30 credit hours. A capstone project is required.

Data Science & Analytics Core

Core Requirements

DASC/CS 620	Introduction to Data Science and Analytics	3
CS 624	Data Analytics and Big Data	3
CS 625	Data Visualization	3
STAT 603	Probability Models for Data Science and Analytics	3
DASC 605	Advanced Statistical Concepts in Data Science	3
Total Credit Hours for Concentration		12
Capstone Course		3
Total Credit Hours		30

Full Stack Concentration

Select four of the following:

12

DASC 600	Programming for Data Science
DASC 728	Deep Learning Fundamentals and Applications
DASC 741	Data-Driven Computational Imaging
DASC 771	Fundamentals of Interpretable Machine Learning and Explainable AI
DASC 781	AI for Health Sciences
DASC 782	Generative AI
BNAL 503	Data Visualization and Exploration
BNAL 515	Advanced Business Analytics/Big Data Applications
CS 522 or ECE 607	Introduction to Machine Learning Machine Learning I
CS 532	Web Science
CS 550 or IT 650	Database Concepts Database Management Systems
CS 569	Data Analytics for Cybersecurity
CS 732	Human Computer Interaction
CS 733	Natural Language Processing
CYSE 607	Advanced Digital Forensics
CYSE 610	Advanced Cryptography
CYSE 635	AI Security and Privacy
ECE 784	Computer Vision
GEOG 600	Geospatial Data Analysis
GEOG 601	Spatial Statistics and Modeling
PHYS 520 or PHYS 711	Introductory Computational Physics Computational Physics

Total Credit Hours

12