

DATA SCIENCE (BS IN DATA SCIENCE)

About the Department

Data science studies the principles and practices for representing, analyzing, interpreting, and communicating information derived from data in a field where artificial intelligence is integral to both method and application. The discipline integrates computation, statistics, visualization, ethics, large-scale data analytics, and AI to transform data into insight, prediction, and action. Questions which arise include the following. How should large and complex datasets be organized and processed efficiently? What analytical methods best extract reliable knowledge from data? How can machine learning, generative AI, and related approaches be used responsibly to support discovery, prediction, and decision-making? How can visualization make data, models, and outcomes understandable to human users? What ethical and societal principles should govern the use of data and intelligent systems? How can AI strengthen human understanding and judgment while preserving accountability and transparency?

BS in Data Science

The B.S. in Data Science prepares students to turn data into clear, defensible insights using computing, statistics, visualization, ethics, and contemporary AI methods. Through advanced coursework and sustained project work, students develop the skills to analyze complex data, build and assess models, and communicate findings effectively.

BA in Applied Artificial Intelligence

The BA in Applied AI, offered as a BA in Interdisciplinary Studies and managed by the Department of Data Science, prepares students to use contemporary AI tools responsibly and effectively in real-world settings. Intended to complement a broad range of other fields of study, the program emphasizes problem-solving with AI, critical evaluation of outputs, and the ethical, transparent production of high-quality work across disciplines and professions.

Minor in Data Science

The Minor in Data Science introduces students to the core tools and perspectives needed to make sense of data through computing, statistics, visualization, ethics, and contemporary AI methods. Through focused coursework, students learn to work with data, evaluate models, and communicate evidence-based findings clearly across a wide range of disciplines.

Code	Title	Hours
Core Courses		
DATA 101 or CSCI 141	Reasoning with Generative AI Modern Programming Fundamentals	3
DATA 201	Introduction to Data Science & AI	3
DATA 202	AI & Data Ethics	3
DATA 301	Applied Machine Learning	3
DATA 302	Databases	3
DATA 303	Data Visualization	3
Capstone Courses		
Select one 400 level DATA course to fulfill the capstone requirement ¹		3
Mathematics Courses		
DATA 209	Applied Linear Algebra & Calculus (or MATH 109 AND MATH 111)	3

DATA 210 or MATH 352	Research Design and Statistics Statistical Data Analysis	3
Track Areas		
Students are required to select a track at the time of major declaration.		9
Total Hours		36

¹ DATA 491 Mentored Data Science Teaching and DATA 495 Honors - Data Science may not count towards this requirement. For students successfully completing an honors project, DATA 496 Honors - Data Science may be used to fulfill this requirement. Capstone courses do not count toward credits needed to fulfill Track Area requirements.

Track Areas

Students are required to select a track at the time of major declaration. A track is constituted of three additional methods-oriented courses. Courses selected to fulfill Track Area requirement do not count toward credits needed to fulfill the Capstone requirement.

Major Computing Requirements

The departmental computer proficiency requirement is satisfied through the completion of course work demonstrating programming ability. This is typically satisfied by completion of DATA 201 Introduction to Data Science & AI. Students may petition the Data Science Undergraduate Committee to satisfy the requirement by another course that demonstrates computational proficiency.

Major Writing Requirements

The departmental writing requirement proficiency is satisfied through the completion of course work demonstrating written communications ability. This is typically satisfied by completion of DATA 202 AI & Data Ethics. Students may petition the Data Science Undergraduate Committee to satisfy the requirement by another course that demonstrates written communications ability.

Artificial Intelligence Track

The Artificial Intelligence (AI) track is designed to equip students with the knowledge and skills necessary to develop intelligent systems that can simulate human thought processes, learn from data, and make informed decisions. This track focuses on teaching students how to design, build, and implement AI algorithms and models that can analyze complex data sets, recognize patterns, and predict outcomes with high accuracy.

Code	Title	Hours
Select three of the following:		9
AAI 301	Designing AI Agents	
AAI 302	Agentic Coordination	
DATA 405	Trustworthy AI	
DATA 440	Special Topics	
DATA 441	Advanced Applications of AI	
DATA 442	Neural Networks & Deep Learning	
DATA 446	Generative AI	
DATA 447	Bayesian Reasoning in Data Science	
DATA 448	Reinforcement Learning	
DATA 451	Artificial Intelligence Systems	
Total Hours		9

Algorithms Track

The purpose of this track is to prepare students for positions in which they support the development of new software or algorithms for the ingestion or analysis of large sources of frequently near-real-time data. It provides students with a depth of knowledge on computational efficiency, and teaches the basic theory of how computational bottlenecks might be overcome.

Code	Title	Hours
CSCI 241	Data Structures	3
CSCI 243 or MATH 214	Logic and Discrete Structures Foundations of Math	3
CSCI 303	Algorithms	3
Total Hours		9

Data Application Track

The purpose of this track is to prepare students for positions in which they will conduct predictive analyses using large, potentially near real-time data sets from a wide range of sensors and sources. The coursework will allow students to build data pipelines to ingest large quantities of data into computational environments quickly and efficiently, integrate these data into common frames of reference, process the data using statistical and computational modeling techniques, and update models dynamically based on real-time information.

Students must select three DATA courses numbered 340 or higher which have a significant component of coursework dedicated to the analysis of datasets using Data Science techniques. Special topics courses (DATA 340 Special Topics in Data Application or DATA 440 Special Topics) may be repeated as long as the topics are different. DATA 491 Mentored Data Science Teaching cannot be used to fulfill this requirement. For students pursuing honors projects, DATA 495 Honors - Data Science may count towards this requirement.

Spatial Data Analytics Track

The purpose of this track is to prepare students for positions that require the large-scale analysis of data with a geospatial component, including both satellite and survey information.

Code	Title	Hours
Select three of the following:		9
DATA 431	Spatial Data Discovery	
GIS 201	Introduction to Geographic Information Systems and Spatial Analysis	
GIS 405	Geovisualization & Cartographic Design	
GIS 410	Introduction to Remotely Sensed Imagery and Analysis	
GIS 420	Advanced GIS Analysis & Programming	
Total Hours		9