Data Science and Analysis BS, Computer Science Emphasis

General Education Requirements

Students must satisfy the university general education requirements. Many of the courses for the degree may be used to fulfill math proficiency, information literacy, social science, and math and life/natural sciences requirements. There is no foreign language requirement for the degree.

Satisfactory/Unsatisfactory Option

Courses required for the major may not be taken on a satisfactory/unsatisfactory basis.

Degree Requirements

The BS in Data Science and Analysis consists of a set of core courses along with an emphasis area.

Core Course		
MATH 1800	Analytic Geometry and Calculus I [1]	3-5
or MATH 1100	Basic Calculus	
Statistics Course		**3**
The Introduction to Statistics course should align with the student's Discipline Emphasis Area.		
Choose one of the following:		
SOC/ANTHRO 3220	Quantitative Data Analysis in Social Science Research	
BIOL 4122	Biostatistics	
ECON 3100	Economic Data and Statistics	
CRIMIN 2220	Statistical Analysis in Criminology and Criminal Justice	
MATH 1320	Introduction to Probability and Statistics	
PSYCH 2201	Psychological Statistics	
POL SCI 3000	Political Analysis	
SCMA 3300	Business Analytics and Statistics	
MATH 4005	Exploratory Data Analysis with R	3
CMP SCI 1250	Introduction to Computing	3
CMP SCI 4200	Python for Scientific Computing and Data Science	3
CMP SCI 4342	Introduction to Data Mining	3
Total Hours		**18-20**

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Students interested in the Computer Science emphasis area, the Mathematics Emphasis Area, or in taking additional mathematics courses should take MATH 1800.

Emphasis Area Requirements

CMP SCI 2250	Programming and Data Structures	3
CMP SCI 2261	Object-Oriented Programming	3
CMP SCI 3130	Design and Analysis of Algorithms	3
CMP SCI 3411	Introduction to Data Visualization	3
CMP SCI 4151	Introduction to Statistical Methods for Data Science	3
CMP SCI 4340	Introduction to Machine Learning	3
MATH 1900	Analytic Geometry and Calculus II	5
MATH 3000	Discrete Structures	3
Choose three of the following:		9
CMP SCI 3010	Web Full Stack Development	
CMP SCI 3702	Introduction to Cyber Threats and Defense	
CMP SCI 4030	Introduction to Intelligent Web	
CMP SCI 4300	Introduction to Artificial Intelligence	
CMP SCI 4320	Introduction to Evolutionary Computation	
CMP SCI 4370	Introduction to Biological Data Science	
CMP SCI 4390	Introduction to Deep Learning	
CMP SCI 4610	Database Management Systems	
MATH 2450	Elementary Linear Algebra	
Total Hours		**35**

Other Data Science courses may be included as electives with prior approval of the program coordinator.

Learning Outcomes

Upon completion of the program, graduates will be able to:

- Apply knowledge of statistical data collection, analysis and quantitative modeling techniques
- Demonstrate proficiency in industry-standard programming languages that support data acquisition, retrieval and analysis
- Select, apply and build data-based models and visualizations to devise solutions to data science problems
- Effectively communicate technical results and recommendations in various formats to appropriate audiences
- Identify and interpret the basic computational issues in problem solving
- Apply appropriate tools and techniques necessary for programming practice
- Apply statistical concepts and data science methods to analyze real-world problems using appropriate computer science processes and techniques