

# Data Science

## BS Data Science program mission

"The ability to take data—to be able to understand it, to process it, to extract value from it, to visualize it, to communicate it—that's going to be a hugely important skill in the next decades."

— Hal Varian, Chief Economist at Google

The mission of the program for a BS in Data Science is to equip our students with the necessary digital skills of gathering, analyzing, visualizing, and utilizing data for decision making by providing multidisciplinary, collaborative, active experiences to undergraduate students and professionals.

## Program Goals and Outcomes

Student Learning Goals	Student Learning Outcomes
SLG 1: Students will describe problems that data can solve.	SLO 1.1: Students will identify knowledge gaps that analysis of data can fill. SLO 1.2: Students will formulate questions that data can answer.
SLG 2: Students will describe characteristics of data collection.	SLO 2.1: Students will describe settings where primary data are collected. SLO 2.2: Students will describe various types of data. SLO 2.3: Students describe tools utilized to collect data.
SLG 3: Students will process data.	SLO 3.1: Students will gather existing data from data sources. SLO 3.2: Students will prepare data for analysis. SLO 3.3: Students will apply statistical methods to support analysis of data. SLO 3.4: Students will create visualizations to foster analysis of data.
SLG 4: Students will solve problems using data.	SLO 4.1: Students will interpret answers to questions guiding a study based on data analysis results. SLO 4.2: Students will identify limitations of data analysis results.
SLG 5: Students will communicate data to stakeholders.	SLO 5.1: Students will develop materials for communicating data analysis results to others. SLO 5.2: Students will explain data analysis results to others.
SLG 6: Students will use data to make informed decisions based on data analysis results.	SLO 6.1: Students will identify decisions that may be informed by data analysis findings. SLO 6.2: Students will describe cautions for making decisions based on data analysis findings.

## Bachelor of Science with a Major in Data Science

### Required Core

CSCI 111 or CSCI 160	Introductory Programming and Big Data Computer Science I	4
MATH 146 or MATH 165 & MATH 166	Applied Calculus Calculus I and Calculus II	3
MATH 208	Discrete Mathematics I	4
DATA 211 or MATH 210	Applied Statistics and Data Visualization Elementary Statistics	4
BIT 220	Management Information Systems	3
DATA 240	Programming for Data Science	4
BOTE 247	Spreadsheet Applications * May test out	3
DATA 347	Data Analytics for Business	3
CSCI 331 or CSCI 497	Technology and Society Internship	4
CSCI 356 or BIT 454	Database Management Data and Information Management	4
DATA 350	Project Design and Techniques (Project Design)	3
MATH 445	Probability and Statistics I	4

MATH 446	Probability and Statistics II	4
CSCI 456	Machine Learning, Data Mining, and Artificial Intelligence	4
DATA 491	Data Science Capstone I	2
DATA 494	Data Science Capstone II	2

**General Education and Electives\*\*** **65**

Complete your major with general education courses and combinations of minors, certificates, and/or concentrations. \*\*Up to 69 hours may be needed to reach the 120 total hours required to earn a degree.

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**Total Hours** **120**

Data science is its own integrated, multidisciplinary, professional field. The Data Science Major program is an effort to equip our students with the necessary digital skills of gathering, analyzing, visualizing, and utilizing data that can enhance not only traditional students' careers, but careers of professionals who want to update or move into this vital and growing area of knowledge. Our program offers a cross-disciplined approach, meeting industry demand with program flexibility. By working with other departments to develop a complementary program, the Data Science Major provides opportunities to gain marketable skills in other areas of industry.

## Data Science Minor

CSCI 111 or CSCI 160	Introductory Programming and Big Data Computer Science I	4
DATA 211 or MATH 210	Applied Statistics and Data Visualization Elementary Statistics	4
DATA 240	Programming for Data Science	4
DATA 347	Data Analytics and Visualization	3
CSCI 356 or BIT 454	Database Management Data and Information Management	4

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**Total Hours** **19**

Data science is its own integrated, multidisciplinary, professional field. The Data Science Minor program is an effort to equip our students with the necessary digital skills of gathering, analyzing, visualizing, and utilizing data that can enhance not only traditional students' careers, but careers of professionals who want to update or move into this vital and growing area of knowledge.

## Certificate Program in Data Analytics

CSCI 111	Introductory Programming and Big Data	4
DATA 211	Applied Statistics and Data Visualization	4
DATA 347	Data Analytics and Visualization	3

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**Total Hours** **11**

The Data Analytics Program Certificate is an effort to equip our students with the necessary digital skills of gathering, analyzing, and utilizing data that can enhance not only traditional students' careers, but careers of professionals who want to update or move into this vital and growing area of knowledge.

## CERTIFICATE PROGRAM IN DATA SCIENCE

CSCI 111 or CSCI 160	Introductory Programming and Big Data Computer Science I	4
DATA 211 or MATH 210	Applied Statistics and Data Visualization Elementary Statistics	4
DATA 240	Programming for Data Science	4
CSCI 356 or BIT 454	Database Management Data and Information Management	4

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**Total Hours** **16**

The Data Science Program Certificate is an effort to equip our students with the necessary digital skills of gathering, analyzing, and utilizing data that can enhance not only traditional students' careers, but careers of professionals who want to update or move into this vital and growing area of knowledge.