



DEPARTMENT OF  
HIGHER EDUCATION &  
WORKFORCE DEVELOPMENT

## New Program Report

**Date Submitted:**

07/13/2023

**Institution**

Webster University

**Site Information**

**Implementation Date:**

6/1/2022 12:00:00 AM

**Added Site(s):**

**Selected Site(s):**

Webster University, 470 East Lockwood, St. Louis, MO, 63119-3194

**CIP Information**

**CIP Code:**

307001

**CIP Description:**

A program that focuses on the analysis of large scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.

**CIP Program Title:**

Data Science, General

**Institution Program Title:**

Data Science

**Degree Level/Type**

**Degree Level:**

Bachelor's Degree

**Degree Type:**

Bachelor of Science

**Options Added:**

**Collaborative Program:**

N

**Mode of Delivery**

**Current Mode of Delivery**

Classroom

**Student Preparation**

**Special Admissions Procedure or Student Qualifications required:**

n/a



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## New Program Report

Specific Population Characteristics to be served:

n/a

### Faculty Characteristics

Special Requirements for Assignment of Teaching for this Degree/Certificate:

Webster University has academic policies describing minimum faculty qualifications by discipline. These policies meet or exceed guidelines from the Higher Learning Commission.

Estimate Percentage of Credit Hours that will be assigned to full time faculty:

Webster University strives to have more than 50% of credit hours assigned to full-time faculty. The percentage of credit hours assigned to full-time faculty will vary based on location and student enrollment in a program at any given time. Overall, the percentage of credit hours assigned to full-time faculty ranges from 10 to 20%. At Webster University's main campus in Missouri, percentages are often higher.

Expectations for professional activities, special student contact, teaching/learning innovation:

Faculty are expected to continually engage in appropriate professional development activities to ensure their professional qualifications are current. The University provides resources to help ensure robust student contact and engagement. The University also provides resources for faculty to innovate their teaching/learning to meet clear learning outcome objectives.

### Student Enrollment Projections Year One-Five

<b>Year 1</b>	<b>Full Time: 5</b>	<b>Part Time: 0</b>	
<b>Year 2</b>	<b>Full Time: 5</b>	<b>Part Time: 0</b>	
<b>Year 3</b>	<b>Full Time: 5</b>	<b>Part Time: 0</b>	<b>Number of Graduates:</b> 5
<b>Year 4</b>	<b>Full Time: 5</b>	<b>Part Time: 0</b>	
<b>Year 5</b>	<b>Full Time: 5</b>	<b>Part Time: 0</b>	<b>Number of Graduates:</b> 5

### Percentage Statement:

n/a

### Program Accreditation

Institutional Plans for Accreditation:

Webster University will maintain its accreditation by the Higher Learning Commission. There are no plans to pursue specialized accreditation at this time for this program.

### Program Structure

#### Total Credits:

120

#### Residency Requirements:

n/a

#### General Education Total Credits:

30

#### Major Requirements Total Credits:

61

#### Course(s) Added



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## New Program Report

COURSE NUMBER	CREDITS	COURSE TITLE
CSIS 2500	3	Introductions to Data Science
CSIS 3800	3	Machine Learning
CSIS 4300	3	Database Systems
MATH 3160	3	Linear Algebra
COSC 1550	3	Computer Programming I
MATH 2410	3	Discrete Mathematics
CSIS 3700	3	Data Analytics Methods
CSIS 3410	3	Information Analysis
CSIS 4330	3	Data Mining
MATH 1620	5	Calculus II
CSIS 2700	3	Data Privacy, Security, and Ethics
MATH 1610	5	Calculus I
CSIS 1700	3	Data Exploration
CSIS 4500	3	Data Science Capstone
COSC 4310	3	Database Programming
CSIS 3300	3	R Programming for Data Analytics
MATH 3610	3	Probability
COSC 1800	3	Python Programming
MATH 2200	3	Statistics

**Free Elective Credits:**

29

**Internship or other Capstone Experience:**

CSIS 4500 Data Science Capstone (3 hours)

**Assurances**

I certify that the program will not unnecessarily duplicate an existing program of another Missouri institution in accordance with 6 CSR 10-4.010, subsection (9)(C) Submission of Academic Information, Data and New Programs.

I certify that the program will build upon existing programs and faculty expertise.

I certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

Contact Information

First and Last Name: Heather Goodin

Email: [heathergoodin@webster.edu](mailto:heathergoodin@webster.edu)

Phone: 314-968-7476

# Data Science (BS)

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*This program is offered by the George Herbert Walker School of Business & Technology/Computer and Information Sciences Department. It is available at the St. Louis main campus.*

## Program Description

The bachelor of science degree in data science is designed to address the core knowledge of data science field by focusing on required statistics, mathematics, computer science, and analytics to allow students to discover the fascinating world of data science.

The program includes theoretical and practical applied approaches preparing students to enter the field of data science profession or continue their education in a professional graduate degree program.

## Learning Outcomes

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

- Demonstrate ability to explore data and identify the best statistical and mathematical model to apply for its analysis.
- Demonstrate an ability to articulate, assess, and apply appropriate theories and principles of Machine Learning.
- Develop and implement data analysis strategies based on theoretical principles, ethical considerations, and detailed knowledge of the underlying data.
- Develop meaningful reports and visualization of data analytics appropriate to a technical and non-technical audience.

## Degree Requirements

For information on the general requirements for a degree, see Baccalaureate Degree Requirements under the Academic Policies and Information section of this catalog.

- 61 required credit hours
- Applicable University Global Citizenship Program hours
- Elective credit hours

At least 40 of the required 61 credit hours must be taken at Webster University. All upper-level (3000 and above) courses must be taken at Webster University.

## Required Courses

- COSC 1550 Computer Programming I (3 hours)
- CSIS 1700 Data Exploration (3 hours)
- COSC 1800 Python Programming (3 hours)
- MATH 1610 Calculus I (5 hours)
- MATH 1620 Calculus II (5 hours)
- MATH 2200 Statistics (3 hours)
- MATH 2410 Discrete Mathematics (3 hours)
- CSIS 2500 Introductions to Data Science (3 hours)
- CSIS 2700 Data Privacy, Security, and Ethics (3 hours)
- MATH 3160 Linear Algebra (3 hours)
- CSIS 3300 R Programming for Data Analytics (3 hours)
- CSIS 3410 Information Analysis (3 hours)
- MATH 3610 Probability (3 hours)
- CSIS 3700 Data Analytics Methods (3 hours)
- CSIS 4300 Database Systems (3 hours)
- COSC 4310 Database Programming (3 hours)
- CSIS 4330 Data Mining (3 hours)
- CSIS 3800 Machine Learning (3 hours)
- CSIS 4500 Data Science Capstone (3 hours)