DATA SCIENCE, BACHELOR OF SCIENCE (BS)

This is an interdisciplinary degree program offered jointly between the Department of Mathematics and the Department of Computer Science. The Department of Mathematics is responsible for the advising of majors declared in the program. The program is built on the foundation of courses in mathematics, statistics and computer science with emphasis on skills in analysis and mining of data exhibiting the characteristics of high volume, velocity and variety, and model building and computational skills applicable for reducing and managing large data sets residing in the cloud.

Required Computer Science Courses		
CSCD 110	INTRODUCTION TO PROGRAMMING	5
CSCD 210	PROGRAMMING PRINCIPLES I	5
CSCD 211	PROGRAMMING PRINCIPLES II	5
CSCD 300	DATA STRUCTURES	5
CSCD 320	ALGORITHMS	5
CSCD 327	RELATIONAL DATABASE SYSTEMS	4
CSCD 429	DATA MINING	4
CSCD 430	BIG DATA ANALYTICS	4
Required Mathematic Courses		
MATH 161	CALCULUS I	5
MATH 162	CALCULUS II	5
MATH 163	CALCULUS III	5
MATH 225	FOUNDATIONS OF MATHEMATICS	5
MATH 231	LINEAR ALGEBRA	5
MATH 241	CALCULUS IV	5
MATH 385	PROBABILITY AND STATISTICAL INFERENCE I	5
MATH 444	NUMERICAL LINEAR ALGEBRA	5
MATH 485	PROBABILITY AND STATISTICAL INFERENCE II	5
MATH 486	PROBABILITY AND STATISTICAL INFERENCE III	5
Required Capstone		
MATH 491	SENIOR THESIS	5
Total Credits		92

University Competencies and Proficiencies

English (http://catalog.ewu.edu/undergraduate-degree/#newitemtext)

Mathematics (http://catalog.ewu.edu/undergraduate-degree/#mathcompproficienciestext)

Placement and Clearance Exams (http://catalog.ewu.edu/placement/)

Prior Learning/Sources of Credit AP, CLEP, IB (http://catalog.ewu.edu/prior-learning/)

General Education Requirements (http://catalog.ewu.edu/undergraduate-degree/#generaleducationrequirementstext)**(GER)**

- Minimum Credits—180 cumulative credit hours
  - 60 upper-division credits (300 level or above)
  - 45 credits in residence (attendance) at Eastern, with at least 15 upper-division credits in major in residence at Eastern
- Minimum Cumulative GPA ≥2.0

Breadth Area Core Requirements (BACR)

Humanities and Arts (http://catalog.ewu.edu/undergraduate-degree/#humanitiesandfineartsgecrtext)

Natural Sciences (http://catalog.ewu.edu/undergraduate-degree/#naturalsciencesgecrtext)

Social Sciences (http://catalog.ewu.edu/undergraduate-degree/#socialsciencesgecrtext)

University Graduation Requirements (http://catalog.ewu.edu/undergraduate-degree/#universitygraduationrequirementstext) **(UGR)**

Diversity Course List (http://catalog.ewu.edu/undergraduate-degree/#cultureandgenderdiversityintheuslisttext)

Foreign Language (http://catalog.ewu.edu/undergraduate-degree/#foreignlanguageugrtext) (for Bachelor of Arts)

Global Studies Course List (http://catalog.ewu.edu/undergraduate-degree/#internationalstudiesrequirementtext)

Minor or Certificate (http://catalog.ewu.edu/undergraduate-degree/#majorminororcertificateugrtext)

Senior Capstone Course List (http://catalog.ewu.edu/undergraduate-degree/#capstonecourselisttext)

All admitted students must officially Declare a Major (https://access.ewu.edu/center-for-academic-advising-and-retention/academic-planning-tools/declare-your-major/) by the time they reach 90 credits (junior standing).
Application for Graduation (https://sites.ewu.edu/records-and-registration/files/2017/02/GraduationApp.pdf) must be made at least two terms in advance of the term you expect to graduate (undergraduate and post-baccalaureate).

Use the Catalog Archives (https://catalog.ewu.edu/archives/) to determine two important catalog years (http://catalog.ewu.edu/undergraduate-degree/#activecatalogruletext). SOAR (https://soar.ewu.edu/selfservice/general/home.html) calculates based on these two catalog years.

1. The catalog *in effect at the student's first term* of current matriculation is used to determine **BACR** (Breadth Area Credit Requirements) **and UGR** (Undergraduate Graduation Requirements).
2. The catalog *in effect at the time the student declares a major or minor* is used to determine the program requirements.

Students will:

- apply data mining tools using real-world big data;
- apply software to reduce and manage large data sets residing in the cloud;
- communicate mathematical and statistical concepts both technically and non-technically;
- perform statistical analysis with numerical and symbolic statistical technology/software.

Note: The four listed PLOs will meet or exceed the learning outcomes of the Microsoft Professional Program in Data Science:

- apply statistical methods to data;
- create and validate machine learning models with Azure Machine Learning;
- create data models and visualize data using Excel or Power BI;
- follow a data science methodology;
- use Microsoft Excel to explore data;
- use R or Python to explore and transform data;
- use Transact-SQL to query a relational database;
- write R or Python code to build machine learning models.