

# DATA SCIENCE MAJOR, BACHELOR OF SCIENCE (BS)

This is an interdisciplinary degree program offered jointly between the Department of Mathematics and the Department of Computer Science & Electrical Engineering. 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 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
<b>Computer Science Elective-choose two from the following:</b>		<b>8</b>
CSCD 429	DATA MINING	
CSCD 430	BIG DATA ANALYTICS	
CSCD 484	MACHINE LEARNING	
CSCD 485	DEEP LEARNING	

## Required Mathematic Courses

MATH/HONS 161	CALCULUS I	5
MATH 162	CALCULUS II	5
MATH 163	CALCULUS III	5
MATH 225	FOUNDATIONS OF MATHEMATICS	5
or MATH 301	DISCRETE MATHEMATICS	
MATH 231	LINEAR ALGEBRA	5
MATH 241	CALCULUS IV	5
MATH 385	PROBABILITY AND STATISTICAL INFERENCE I	5
MATH 443	NUMERICAL METHODS	5
MATH 485	PROBABILITY AND STATISTICAL INFERENCE II	5
MATH 486	PROBABILITY AND STATISTICAL INFERENCE III	5

## Required Capstone

MATH 491	SENIOR THESIS	5
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**Total Credits 87**

## Plan of Study

The following plan of study is for a student with zero credits. Individual students may have different factors such as: credit through transfer work, Advanced Placement, Running Start, or any other type of college-level coursework that requires an individual plan.

Courses could be offered in different terms, checking the academic schedule is paramount in keeping an individual plan current. **Students should connect with an advisor to ensure they are on track to graduate.**

All Undergraduate students are required to meet the Undergraduate Degree Requirements (<http://catalog.ewu.edu/undergraduate-degree/>).

First Year					
Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
ENGL 101	5	ENGL 201	5	MATH 161	5
MATH 141	5	MATH 142	5	Humanities & Arts BACR 2 <sup>1</sup>	5
Humanities & Arts BACR 1 <sup>1</sup>	5	Social Science BACR 1 <sup>1</sup>	5	Natural Science BACR 1 <sup>1</sup>	5
15		15		15	
Second Year					
Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
CSCD 110	5	CSCD 210	5	CSCD 211	5
MATH 162	5	MATH 163	5	MATH 241	5
MATH 231	5	MATH 225 or 301	5	Social Science BACR 2 <sup>1</sup>	5
15		15		15	
Third Year					
Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
CSCD 300	5	CSCD 320	5	CSCD 327	4
MATH 385	5	MATH 485	5	MATH 486	5
Natural Science BACR 2 <sup>1</sup>	5	Global Studies - graduation requirement <sup>1</sup>	5	Diversity - graduation requirement <sup>1</sup>	5
				Elective - certificate, minor, or general elective	1
15		15		15	
Fourth Year					
Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
Computer Science Elective <sup>2</sup>	4	Computer Science Elective <sup>2</sup>	4	MATH 443	5
Elective - certificate, minor, or general elective	5	Elective - certificate, minor, or general elective	5	MATH 491 (Senior Capstone - graduation requirement)	5
Elective - certificate, minor, or general elective	5	Elective - certificate, minor, or general elective	5	Elective - certificate, minor, or general elective	5
Elective - certificate, minor, or general elective	1	Elective - certificate, minor, or general elective	1		
15		15		15	
<b>Total Credits 180</b>					

<sup>1</sup> University Graduation Requirements (UGR) and Breadth Area Course Requirements (BACR) courses may be less than 5 credits and additional credits may be required to reach the required 180 total credits needed to graduate. Students should connect with an advisor to ensure they are on track to graduate.

<sup>2</sup> Computer Science Elective-choose two from the approved list.

## University Competencies and Proficiencies

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

Quantitative and Symbolic Reasoning (<http://catalog.ewu.edu/undergraduate-degree/#mathcompproficienciestext>)

Placement and Clearance (<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  $\geq 2.0$

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### 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>)

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

Diversity Course List (<http://catalog.ewu.edu/undergraduate-degree/#cultureandgenderdiversityintheuslisttext>)  
World Language (<http://catalog.ewu.edu/undergraduate-degree/#worldlanguagetext>) (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>)

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Application for Graduation (use EagleNET (<https://inside.ewu.edu/eaglenet/>)) must be made at least two terms in advance of the term you expect to graduate (undergraduate and post-baccalaureate).

Use the Catalog Archives (<http://catalog.ewu.edu/archives/>) to determine *two important catalog years*.

Requirements in Degree Works (<https://inside.ewu.edu/records-and-registration/degree-works/>) are based on these two catalog years:

- a. 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).
- b. The catalog *in effect at the time the student declares a major or minor* is used to determine the program requirements.

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### Students who earn a BS in Data Science from EWU should be able to:

- use theoretical mathematical/statistical concepts to perform analyses/computations;
- apply data mining tools using real-world big data;
- apply software to reduce and manage large data sets;
- communicate mathematical and statistical concepts both technically and non-technically;
- perform analysis with technology/software.