

# B.S. in Data Science

The Bachelor of Science degree in Data Science program offers a comprehensive and innovative curriculum that prepares students to excel in the data-driven world. Students learn skills to collect, manage, interpret, and analyze data in order to assist in making data-driven decisions. The goal of the program is to educate and graduate professionals who are equipped for employment as data scientists or to continue their education in graduate school.

Data Science is an applied discipline that addresses the challenge of generating actionable knowledge from data. Using interdisciplinary methods to extract knowledge or insights from large quantities of data, data scientists employ techniques and theories drawn from mathematics, statistics, and computer sciences and apply them to data-rich domains.

Our project-based approach, industry partnerships, and emphasis on research and practical applications provide students with the necessary skills and experience to thrive in the field of data science.

## Students will:

- Use data to construct evidence-based solutions.
- Assimilate skills acquired through the degree program in application to a capstone project providing solutions to real-world challenges.
- Acquire data from a variety of sources including public research, web pages, and social media.
- Convert unstructured and varied data into analysis-ready form.
- Use software packages and libraries to support data analysis.
- Use statistical theory and modern machine learning techniques to model observations and make predictions.
- Implement data storage and processing architectures across clusters of commodity hardware and cloud resources.
- Manage issues related to program performance, scalability, and high-availability.
- Communicate deftly with proficiency in both verbal and nonverbal communication.
- Present actionable results of data analysis in multimedia formats to both technical and nontechnical audiences.

## General Education Requirements

For a full description of Embry-Riddle General Education guidelines, please see the General Education section of this catalog. These minimum requirements are applicable to all degree programs.

Communication Theory & Skills (COM 122, COM 219, COM 221)	9
Humanities - Lower level	3
Social Sciences - Lower level	3
Humanities or Social Sciences - Lower or Upper level	3
Humanities or Social Sciences - Upper level	3
Computer Science (CS 223 or EGR 115)	3
Mathematics (MA 241 & MA 242)	8
Physical and Life Sciences - one course must include a lab	7
<b>Total Credits</b>	<b>39</b>

## Data Science Degree Requirements

UNIV 101	College Success	1
<b>Data Science Core</b>		
CS 222	Introduction to Discrete Structures	3
CS 225	Computer Science II	4
CS 315	Data Structures and Analysis of Algorithms	3
CS 317	Files and Database Systems	3
DS 444	Scientific Visualization	3

DS 490	Data Science Capstone	3
MA 243	Calculus and Analytical Geometry III	4
MA 412	Probability and Statistics	3
MA 413	Statistics	3
MA 432	Linear Algebra	3

### Applied Data Science Concentration

DS 390	Research Project in Industrial Mathematics	3
DS 440	Data Mining	3
MA 210	Introduction to Data Science	3
MA 305	Introduction to Scientific Computing	3
MA 360	Mathematical Modeling & Simulation I	3
MA 453	High Performance Scientific Computing	3

### Electives 15

All students must declare and complete any Minor/Two Degrees of the Same Rank/Double Major (ROTC courses are acceptable)

### Any-Level Open Electives 9

### Upper-Level Open Electives 6

### Total Credits 81

### Total Degree Credits 120

### Year One

		Credits
COM 122	English Composition	3
COM 219	Speech	3
EGR 115	Introduction to Computing for Engineers	3
or CS 223	Scientific Programming in C	
MA 210	Introduction to Data Science	3
MA 241	Calculus and Analytical Geometry I	4
MA 242	Calculus and Analytical Geometry II	4
	Physical Science Elective	3
UNIV 101	College Success	1
	Humanities Lower-Level Elective	3
	Social Science Lower-Level Elective	3
<b>Credits Subtotal</b>		<b>30.0</b>

### Year Two

MA 243	Calculus and Analytical Geometry III	4
MA 305	Introduction to Scientific Computing	3
MA 412	Probability and Statistics	3
CS 222	Introduction to Discrete Structures	3
CS 225	Computer Science II	4
	Physical Science Elective	3
	Physical Science Laboratory	1
	Elective *	3
	Open Elective	6
<b>Credits Subtotal</b>		<b>30.0</b>

### Year Three

COM 221	Technical Report Writing	3
CS 315	Data Structures and Analysis of Algorithms	3
CS 317	Files and Database Systems	3
DS 390	Research Project in Industrial Mathematics	3
DS 440	Data Mining	3
MA 360	Mathematical Modeling & Simulation I	3
MA 413	Statistics	3
MA 432	Linear Algebra	3
	Elective *	3
	Open Electives	3
<b>Credits Subtotal</b>		<b>30.0</b>

### Year Four

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MA 453	High Performance Scientific Computing	3
DS 444	Scientific Visualization	3
DS 490	Data Science Capstone	3
	Lower or Upper-Level Humanities or Social Science Elective	3
	Upper Level Humanities or Social Science Elective	3
	Elective *	9
	Open Electives	6
	<b>Credits Subtotal</b>	<b>30.0</b>
	<b>Credits Total:</b>	<b>120.0</b>