

# DATA SCIENCE UNDERGRADUATE MAJOR (BS, HBS)

This program is available at the following locations:

- Corvallis
- Ecampus

Options available:

- Advanced Data Science (<https://catalog.oregonstate.edu/college-departments/science/statistics-data-science/data-science-bs-hbs/advanced-data-science-option/>)
- Economics (<https://catalog.oregonstate.edu/college-departments/science/statistics-data-science/data-science-bs-hbs/economics-option/>)
- Environmental Economics and Policy (<https://catalog.oregonstate.edu/college-departments/science/statistics-data-science/data-science-bs-hbs/environmental-economics-policy-option/>)
- Life Science (<https://catalog.oregonstate.edu/college-departments/science/statistics-data-science/data-science-bs-hbs/life-science-option/>)
- Psychological Science (<https://catalog.oregonstate.edu/college-departments/science/statistics-data-science/data-science-bs-hbs/psychological-science-option/>)

The Bachelor of Science in Data Science provides a comprehensive curriculum designed to prepare students for careers in the rapidly evolving field of data science. Students will develop a strong foundation in computational and analytical tools, data science methodologies, and their practical applications, while also gaining a comprehensive understanding of the ethical implications involved in data systems and solutions. The major fosters critical thinking, problem-solving, and ethical decision-making, equipping graduates to thrive in a data-centric world.

**Major Code: A051**

Upon successful completion of the program, students will meet the following learning outcomes:

- Analyze and interpret data using statistical methods, computing skills, and other data science tools and technologies.
- Assess real-world data problems and propose analytical methods to achieve effective and ethical solutions.
- Communicate data findings clearly and effectively to diverse audiences, tailoring messages to ensure understanding and impact.
- Collaborate effectively within diverse teams, valuing different perspectives and fostering civil discourse to enhance problem-solving and project outcomes.

Code	Title	Credits
<b>Required Core</b>		
MTH 231	ELEMENTS OF DISCRETE MATHEMATICS	4
MTH 251Z	+DIFFERENTIAL CALCULUS	4
MTH 252Z	INTEGRAL CALCULUS	4
MTH 267	LINEAR ALGEBRA FOR DATA SCIENCE	3
MTH 301	+INTEGRAL HISTORIES AND SOCIAL ISSUES IN MATHEMATICS	3

or DS 350	+DATA FOR GOOD	
ST 314	INTRODUCTION TO STATISTICS FOR ENGINEERS	3-4
or ST 351	INTRODUCTION TO STATISTICAL METHODS	
ST 411	METHODS OF DATA ANALYSIS	4
ST 412	METHODS OF DATA ANALYSIS	4
ST 421	INTRODUCTION TO MATHEMATICAL STATISTICS	4
ST 422	INTRODUCTION TO MATHEMATICAL STATISTICS	4
ST 437	DATA VISUALIZATION	3
CS 162	INTRODUCTION TO COMPUTER SCIENCE II	4
CS 261	DATA STRUCTURES	4
CS 340	INTRODUCTION TO DATABASES	4
WR 227Z	+*TECHNICAL WRITING	3-4
or WR 362	+*SCIENCE WRITING	
DS 101	+EXPLORING CAREERS IN DATA SCIENCE	1
DS 201	+INTRODUCTION TO DATA SCIENCE	4
DS 231	PYTHON PROGRAMMING FOR DATA SCIENCE	4
DS 431	STATISTICAL LEARNING FOR DATA SCIENCE	3
DS 495	+*CAPSTONE AND CAREER: DATA SCIENCE	3
<b>Electives <sup>1</sup></b>		
Select two data science courses from the following or complete an option:		6-7
DS 451	METHODS OF DATA ANALYSIS FOR COMPLEX AND NETWORK DATA	
DS 453	BAYESIAN MODELS FOR DATA SCIENCE	
DS 455	CAUSAL INFERENCE FOR EXPERIMENTAL AND OBSERVATIONAL DATA	
Select one statistics course from the following or complete an option:		3-4
ST 413	METHODS OF DATA ANALYSIS	
ST 415	DESIGN AND ANALYSIS OF PLANNED EXPERIMENTS	
ST 431	SAMPLING METHODS	
ST 436	R PROGRAMMING FOR DATA	
ST 439	SURVEY METHODS	
ST 441	PROBABILITY, COMPUTING, AND SIMULATION IN STATISTICS	
ST 443	APPLIED STOCHASTIC MODELS	
Select three additional upper-division courses of a data science nature or complete an option <sup>2</sup>		9
<b>Remaining Core Ed and Electives</b>		<b>88-91</b>
<b>Total Credits</b>		<b>180</b>

\* Baccalaureate Core course. Applies to general education requirements for undergraduate students in a catalog year up to 2024-2025

+ Core Education course. Applies to general education requirements for undergraduate students in catalog year 2025-2026 and beyond

<sup>^</sup> Writing Intensive Curriculum (WIC) course

<sup>1</sup> Students may complete an option but it is not required for the major.

For students who do not select an option, they must complete the elective requirements for the major

<sup>2</sup> These may include non-blanket upper-division MTH, CS, BDS courses or other courses approved by the departmental head advisor

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*Degree plans are subject to change and the following is only an example of how students may complete their degree in four years. Students should consult their advisor to determine the best degree plan for them. Contact details for advisors can be found on the Academic Advising (<https://catalog.oregonstate.edu/advising/>) page.*

<b>First Year</b>		<b>Credits</b>
<b>Fall</b>		
DS 101	+EXPLORING CAREERS IN DATA SCIENCE	1
WR 121Z	+*COMPOSITION I	4
Core Ed: Communication, Media & Society		3-4

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Core Ed: Arts & Humanities General	3-4
Core Ed: Transitions	2
<b>Credits</b>	<b>15</b>
<b>Winter</b>	
DS 201 +INTRODUCTION TO DATA SCIENCE	4
Core Ed: Arts & Humanities Global	3-4
Core Ed: Social Science	3-4
Elective	4
<b>Credits</b>	<b>16</b>
<b>Spring</b>	
DS 231 PYTHON PROGRAMMING FOR DATA SCIENCE	4
Core Ed: Scientific Inquiry & Analysis	4
Core Ed: Difference, Power & Oppression Foundations	3-4
Elective	3
<b>Credits</b>	<b>14</b>
<b>Second Year</b>	
<b>Fall</b>	
MTH 231 ELEMENTS OF DISCRETE MATHEMATICS	4
MTH 251Z +*DIFFERENTIAL CALCULUS	4
CS 162 INTRODUCTION TO COMPUTER SCIENCE II	4
Core Ed: Scientific Inquiry & Analysis	4
<b>Credits</b>	<b>16</b>
<b>Winter</b>	
CS 261 DATA STRUCTURES	4
MTH 252Z INTEGRAL CALCULUS	4
WR 227Z +*TECHNICAL WRITING or WR 362 or +*SCIENCE WRITING	3-4
Elective	3
<b>Credits</b>	<b>15</b>
<b>Spring</b>	
MTH 267 LINEAR ALGEBRA FOR DATA SCIENCE	3
CS 340 INTRODUCTION TO DATABASES	4
ST 314 INTRODUCTION TO STATISTICS FOR ENGINEERS or ST 351 or INTRODUCTION TO STATISTICAL METHODS	3
Elective	4
<b>Credits</b>	<b>14</b>
<b>Third Year</b>	
<b>Fall</b>	
ST 411 METHODS OF DATA ANALYSIS	4
ST 421 INTRODUCTION TO MATHEMATICAL STATISTICS	4
Elective	4
Elective	3
<b>Credits</b>	<b>15</b>
<b>Winter</b>	
ST 412 METHODS OF DATA ANALYSIS	4
ST 422 INTRODUCTION TO MATHEMATICAL STATISTICS	4
Elective	4
Elective	3
<b>Credits</b>	<b>15</b>
<b>Spring</b>	
DS 431 STATISTICAL LEARNING FOR DATA SCIENCE	3
MTH 301 +INTEGRAL HISTORIES AND SOCIAL ISSUES IN or DS 350 MATHEMATICS or +DATA FOR GOOD	3
ST 437 DATA VISUALIZATION	3
Option or Elective Course	3
Elective	3
<b>Credits</b>	<b>15</b>
<b>Fourth Year</b>	
<b>Fall</b>	
Option or Elective Course	15
<b>Credits</b>	<b>15</b>

<b>Winter</b>	
Option or Elective Course	15
<b>Credits</b>	<b>15</b>
<b>Spring</b>	
DS 495 +*CAPSTONE AND CAREER: DATA SCIENCE	3
Elective	12
<b>Credits</b>	<b>15</b>
<b>Total Credits</b>	<b>180</b>

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