

# Data Science (MS)

The master of science (MS) in data science at the University of Oregon prepares students to effectively use data to make positive change in the world. To do this, a data scientist must engage with the bigger picture, from data sourcing and curation through goal formulation to outcome evaluation and communication.

Our program equips students with both expertise in cutting edge data science methodology, and the broader competencies needed to work across diverse teams and real-world applications. These enduring skills help graduates achieve long-term career goals and thrive as effective data scientists in any setting.

The MS in data science enables students from a wide variety of academic and professional backgrounds to achieve mastery of data science techniques in as little as one year. Students in the program work with real-world data to formulate and implement models and analyses, gain experience with modern predictive and inferential toolsets, communicate complex analyses intuitively to stakeholders, and skillfully navigate social and ethical dimensions of data-based decision-making.

Whether you're bound for a career as a data analyst at a Fortune 500, doing fundamental science, or informing local decision-making, we have room in our program for your background, interests, and goals.

## Program Information and Admission Process

Please visit the department's website (<https://scds.uoregon.edu/ds/graduate-programs/ds-masters>).

## Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Be capable of working with a diverse range of data structures, formats, and sizes, and be able to implement clear, reproducible workflows for data cleaning and manipulation with appropriate tools, including AI-assisted and automated systems.
- Have a comprehensive toolbox of computational proficiencies, and a readiness to learn new skills as necessary and leverage rapidly developing AI technologies as necessary.
- Have a strong foundational and applied knowledge of statistical concepts, and understand how these concepts motivate varying approaches to data exploration and visualization, prediction, and inference.
- Based on data at hand, be able to ask tractable questions and formulate appropriate analyses by leveraging a wide range of modeling and optimization frameworks, with emphasis on predictive modeling and machine learning.
- Be able to skillfully carry out chosen analyses and rigorously assess outcomes. Have the ability to confidently evaluate analyses for appropriateness and accuracy, including existing and AI-generated pipelines.
- Be able to present otherwise complex analysis results in an intuitive, easily comprehensible manner, with actionable recommendations for diverse stakeholders.
- Appreciate and effectively assess the social, ethical, and legal dimensions of data and algorithm use. Be familiar with methods to maintain privacy, enhance transparency, and avoid bias in algorithmic decision-making, statistical inference, and use of generative AI.

## Data Science Major Requirements

Courses used to fulfill the major requirements must be taken for a letter grade and passed with a grade of B- or better. Students may petition to replace a required course with another course (with the same number of units) if they can demonstrate equivalent prior work (for instance, by taking the course at UO).

Code	Title	Credits
<b>Core courses - take all 6</b>		
DSCI 531	Data Access and Management	4
DSCI 535	Data Mining, Exploration, and Visualization	4
DSCI 632	Statistics for Data Science	4
DSCI 633	Machine Learning I	4
DSCI 634	Machine Learning II	4
PHIL 623	Data Ethics	4
<b>Elective courses - take any 3; the following is a list of pre-approved courses, but others can be substituted with approval of the Graduate Advisor:</b>		<b>12</b>
ACTG 580	Accounting Data Analytics I	
ACTG 681	Accounting Data and Analytics II	
BI 561	Systems Neuroscience	
CH 547	Computational Chemistry	
CS 571	Introduction to Artificial Intelligence	
CS 573	Probabilistic Methods for Artificial Intelligence	
EC 522	Economic Forecasting	
EC 523	Econometrics	
EC 527	Games and Decisions	
ERTH 518	Earth and Environmental Data Analysis	
GEOG 581	GIScience I	
GEOG 582	GIScience II	
GEOG 585	Remote Sensing I	
GEOG 586	Remote Sensing II	
GEOG 591	Advanced Geographic Information Systems	
GEOG 594	Spatial Analysis	
GEOG 595	Geographic Data Analysis	
JCOM 642	Quantitative Research Methods	
MKTG 515	Marketing Analytics	
PSY 512	Applied Data Analysis	
PSY 558	Decision-Making	
<b>Research/Internship - minimum of 9 credits selected from one or more of the following courses:</b>		<b>9</b>
DSCI 601	Research: [Topic]	
DSCI 604	Internship: [Topic]	
DSCI 636	Synthetic Project Capstone	
<b>Total Credits</b>		<b>45</b>