

Data Science Degree Requirements

Data Science is an emerging field encapsulating interdisciplinary activities, used to create data-centric products, applications or programs that address specific scientific, socio-political, or business questions. It is making deep inroads in industry, government, health, and journalism. Due to the growing need for applying data science techniques in these and other domains, there is a significant shortage of trained data scientists. Data Science incorporates practices from a variety of fields in computer science, chiefly machine learning, statistics, databases, systems, algorithms, and visualization. The undergraduate data science specialization enables students to get the broad variety of skills needed to be successful data scientists.

Students looking to pursue the data science specialization are required to complete the lower level courses (MATH140, MATH141, CMSC131, CMSC132, CMSC216, CMSC250), the additional required courses (CMSC330, CMSC351, STAT400 and MATH240), and the upper level concentration requirements. The difference in the specialization is the upper level computer science courses.

Students must fulfill their computer science upper level course requirements from at least 3 areas. Students may fulfill an area requirement under the Upper Level Elective Courses requirement. Courses that fall within each area are listed in the CS Distributive Areas and Electives

(/sites/undergrad.cs.umd.edu/files/images/uploads/2022/07/2208%20Computer%20Science%20Distributive%20Areas%20and%20Electives.pdf) document.

The five areas are:

- Area 1: Systems;

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- Area 4: Theory;
- Area 5: Numerical Analysis.

Required

MATH 240 (4) Linear Algebra **or**

MATH 461 (3) Linear Algebra for Scientists and Engineers **or**

MATH 341 (4) Multivariable Calculus, Linear Algebra, Differential Equations II*

STAT 400 (3) Applied Probability and Statistics I

CMSC 320 (3) Introduction to Data Science

CMSC 422 (3) Introduction to Machine Learning *

CMSC 424 (3) Database Design

Choose one course from:

CMSC 420 (3) Data Structures

CMSC 421 (3) Introduction to Artificial Intelligence

CMSC 423 (3) Bioinformatic Algorithms, Databases, and Tools

CMSC 425 (3) Game Programming

CMSC 426 (3) Computer Vision

CMSC 427 (3) Computer Graphics *

CMSC 470 (4) Natural Language Processing *

Choose one course from:

CMSC 451 (3) Design and Analysis of Computer Algorithms

CMSC 454 (3) Algorithms for Data Science

CMSC 460 (3) Computational Methods

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CMSC 411 (3) Computer Systems Architecture

CMSC 412 (4) Operating Systems *

CMSC 414 (3) Computer and Network Security

CMSC 417 (3) Computer Networks

CMSC 430 (3) Introduction to Compilers

CMSC 433 (3) Programming Language Technologies and Paradigms

CMSC 434 (3) Introduction to Human-Computer Interaction

CMSC 435 (3) Software Engineering *

**Indicates this course has unique prerequisites.*

Contact Our Office

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