DATA SCIENCE MINOR (MATH)

Program Director: Wojciech Czaja, Ph.D.

The Data Science minor will offer a rigorous training in this interdisciplinary field, which combines scientific methods, processes, and algorithms to extract knowledge from data and the information it contains. Students will complete a required set of DATA courses which focus on fundamental areas of computer science, mathematics, and statistics, as well as ethics and best practices in data science. The scientific method introduced in these courses is what separates modern Data Science from broadly understood data analytics. The proposed program integrates these aspects with an in-depth look into critical ethical and privacy aspects of the modern data-dependent world. This combination creates a unique undergraduate offering and it provides students with necessary tools for a broad range of careers, ranging from private sector employment, to government and research.

Restriction: Students in the Mathematics major Statistics specialization (1701S) major, the Computer Science major Data Science specialization (0701B), or the Computer Science major Machine Learning specialization (0701F) may not enroll in the Data Science minor.

Program Learning Outcomes

1. Apply modern data science techniques arising in the fields of computer science and mathematics to solve real-world problems, with a special emphasis on problems arising in the context of biomedical, natural and physical sciences.
2. Demonstrate critical thinking and innovation skills in the design of data science techniques as applied to data curation, analysis, modeling, visualization, or decision making, while understanding how to identify and express limitations in the application of models as analytic and predictive tools.
3. Communicate and collaborate in a variety of professional contexts and in diverse environments, demonstrating the understanding of principles of effective data visualization design for data communication, as well as communicating effectively with diverse audiences.
4. Understand the human and ethical implications of data science and integrate that knowledge into the design and execution of their work by applying relevant ethical and social standards to: demonstrate understanding of privacy issues; analyze and discuss social impacts in the realm of data science; advocate for ethical decision making in the use of data.

REQUIREMENTS

A grade of C- or better is required for all DATA minor course requirements. Students must take DATA100, STAT100, MATH135, or any 400-level STAT course as a prerequisite for the minor.

Course	Title	Credits
DATA110	Applications of R for Data Science	1
DATA120	(Python Programming for Data Science)	1
DATA200	(Best Practices for Big Data Collection and Analysis)	3
DATA250	(Discrete Mathematics) [1]	4
DATA320	(Introduction to Data Science) [2]	3
DATA350	(Data Visualization and Presentation)	3
DATA400	Applied Probability and Statistics I [3]	3
Total Credits		**18**

1. DATA250 can be replaced by CMSC250 and MATH240
2. DATA320 can be replaced by CMSC320
3. DATA400 can be replaced by STAT400 or STAT410

Course Prerequisite: MATH141 is a prerequisite for some of the courses in this program.

No more than 2 courses for the minor in Data Science may be taken at an institution other than the University of Maryland, College Park.