Data Science Program Guide

Data Science is a rapidly growing field providing students with exciting career paths, and opportunities for advanced study. The Data Science major gives students a foundation in those aspects of computer science, statistics, and mathematics that are relevant for analyzing and manipulating voluminous and/or complex data. Students majoring in Data Science will learn computer programming, data analysis, and database systems, and will learn to think critically about the process of understanding data. The Data Science major is a rigorous program that covers the practical use of Data Science methods as well as the theoretical properties underpinning the performance of the methods and algorithms.

1. Declaring

Students will need to follow the Statistics Department's Declaration Process, which includes logging on to the Canvas site and following the directions there.

**To declare the major, students must have completed the introductory data science, introductory programming, calculus I and calculus II prerequisites, with a grade of C or better. The remaining prerequisites (linear algebra and calculus III) can be taken after declaration.*

2. Grade Requirements

A grade of C or higher is required in the prerequisite courses, Data Science program core, required courses, advanced technical electives, and capstone.

3. Minor and Double Major Regulations

Students in LSA may double major in Computer Science(LSA) and Data Science(LSA). Students majoring in Data Science are not eligible to minor in Data Science, Statistics, or Computer Science.

4. Program Requirements:

Prerequisites

Introductory data science: DATASCI 101 (recommended) or STATS 250 or STATS 280 or IOE 265 or ECON 451 or TO 301.
Introductory programming: EECS 180 or 183.
Calculus I: MATH 115 or 120 or 185 or 275 or 295.
Calculus II: MATH 116 or 121 or 186 or 276 or 296.
Calculus III: MATH 205 or 215 or 285 or 296.
Linear algebra: EECS 245 or MATH 214 or 217.

Program Core
(4) EECS 203 Discrete Math (Math 465 also accepted)
(4) EECS 280 Programming and Introductory Data Structures
(4) EECS 281 Data Structures and Algorithms or (4) EECS 291 Applied Data Structures and Algorithms
(4) STATS 413 Applied Regression Analysis

Statistical Theory | Choose **one** of the following:

(3) STATS 412 Introduction to Probability and Statistics
(3) STATS/MATH 425 Introduction to Probability
(3) STATS 426 Introduction to Theoretical Statistics

Additional Required Courses
(4) Machine Learning (choose **one**): DATASCI 415 or EECS 445

(4) Database & Web Systems (choose **one**): EECS 484 or 485

At least one course in each of the following categories **(the same course cannot count in more than one category)**.

- One course from the **Applications Electives** list. A list of approved courses is available here.
- One course from the **Advanced Technical Electives** list. A list of approved courses is available here.
- One course in **Advanced Statistical Analysis.** A list of approved courses is available here.

Additional **application electives**, **advanced technical electives**, or **advanced statistical analysis** electives, as needed, to satisfy the **42 credits** for the major.

If you would like to petition for a course to be approved as an elective or capstone, please submit a request using this link. To be considered the course must be taught at UM and must not have previously been denied.

Capstone Experience (4 credits)
Any path to meeting the capstone requirement other than pre-approved regular courses (see below) must be pre-approved by a Data Science advisor.

- **Approved DS Capstone Courses**
- Capstone Alternative - Multidisciplinary Design Project (MDP):
  Students may use a Multidisciplinary Design Project (MDP) to fulfill the capstone requirement in the Data Science major.

Due the last day of class in the second MDP term, students taking an MDP project for DS capstone must upload materials and fill out the Google Form.

- Requirements Status Update Report
- Design Review 2: Faculty Panel Review
- Final Deliverable Quality Documentation
- A 500-word summary of the major components of your MDP project. How did you specifically contribute to the project? And how is this project specifically related to data science?
    - Students can make an advising appointment with the DS-LSA advising chair or DS-ENG CPA for questions about this summary.

5. Honors Program

Any LSA Data Science student with a current grade point average of at least 3.4 may apply for admission to the LSA Data Science Honors major program. The application is made through a Statistics Department undergraduate advisor. Students in the Honors program must complete the regular major program with an overall GPA of at least 3.5. In addition, LSA Data Science Honors majors must elect the Senior Honors Seminar (STATS 499) and complete a project or thesis under the direction of a member of the Statistics Department or EECS faculty.

6. EECS Grade Policy

Grades of "C" or better must be achieved in all courses used to satisfy the pre-declaration and other major requirements. A grade of "C-" or below is considered a failing grade and the course must be repeated or substituted with another class.

If you currently have an Incomplete grade due to an Honor Code violation, you may proceed with the EECS coursework via override. Please submit an override request to enroll in courses for which your Incomplete grade serves as a prerequisite. If this Honor Code Incomplete is in a pre-declaration requirement, you can proceed with declaring CS-Eng as your major once all other pre-declaration requirements are met.
If you receive a final grade below a C after an Honor Code case resolves, you are required to retake the course for a C or higher letter grade. This retake must be completed as soon as possible, and can be taken alongside other EECS courses, even if your failed class typically serves as a prerequisite. If an override is needed due to prerequisite issues, please submit one here and attach any communication about your Honor Code decision in the form.
For questions about your Honor Council case, please contact honorcouncil-admin@umich.edu.

7. Advising

Students may make an appointment with a faculty advisor or an undergraduate program coordinator during the academic year. Students may also attend open advising with an undergraduate program coordinator. Open advising is intended to answer quick questions and be at most a 10-minute conversation. Information about making appointments and open advising can be found on the Statistics Department's website Advising Page.

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