



Course Information

Course Title: Coding for Criminology

Course Number: CCJS 418E

Term: *Fall / 2024*

Course Times:

- Tue: 3:30-4:45 (Zoom)
- Thu: 3:30-4:45 (SQH 1120)

Instructor: Zubin Jelveh (zjelveh@umd.edu)

Zubin's Office Hours: TBD and by appointment

TA: Madisen Placzkowski (mplacz@umd.edu)

Madisen's Office Hours: TBD

Course Description

This course introduces criminology undergraduates to the fundamentals of coding in Python through hands-on data analysis with real-world crime data. Students will learn how to use Python and its associated libraries to explore, analyze, and derive insights from various datasets related to crime, arrest records, and socio-demographic factors from a large city in the Northeast.

The course is structured to provide students with a solid foundation in Python programming, focusing on its applications in criminology and criminal justice. Through a combination of lectures and practical coding labs, students will cover essential topics such as data manipulation, visualization, statistical analysis, and basic machine learning algorithms.

The course will begin with an introduction to Python programming and the key libraries used for data analysis. Students will learn how to load, clean, merge, and preprocess datasets to prepare them for analysis. As the course progresses, students will explore descriptive statistics and data visualization techniques to identify patterns, trends, and distributions in crime data. They will also be introduced to predictive modeling and the basics of machine learning algorithms.

Throughout the course, emphasis will be placed on the importance of critical thinking and ethical considerations when working with sensitive crime data. Students will learn to recognize and address potential biases in the data and understand the responsibility of presenting findings accurately and objectively.

By the end of the course, students will have gained practical programming skills and a comprehensive understanding of how data analysis can be used to generate valuable insights in the field of criminology. They will be prepared to apply their knowledge to real-world data challenges, effectively communicate their findings, and contribute to data-driven decision-making processes within the criminal justice system.

No prior programming experience is necessary, as the course will start with the basics and gradually build students' skills. Assessment will include quizzes, homework assignments, a midterm, and a final project, providing students with ample opportunities to practice and apply their learning to practical problems.

Course Structure:

- Quizzes to reinforce key concepts and ensure continuous learning
- Homework assignments to apply programming skills to real-world problems
- Mid-term and final project to assess comprehensive understanding of course material
- Alternating lectures and hands-on Python programming labs for a balanced learning experience

Course Objectives:

By the end of this course, students will be able to:

1. Understand and apply the fundamentals of Python programming for data analysis
2. Manipulate, clean, and merge datasets to prepare them for analysis
3. Create meaningful visualizations and derive insights from criminal justice data
4. Perform basic statistical analyses to identify patterns and trends
5. Analyze social networks to uncover criminal associations and power dynamics

Required Resources

This course does not stick to particular textbooks. Readings and course materials will be provided on the elms course site. No purchases required.

Laptop – We will do live exercises in class in Python.

Letter Grade Cutoffs

In the table below, g_i is the grade for i-th student

A+	$97 \leq g_i \leq 100^*$	B+	$87 \leq g_i < 90$	C+	$77 \leq g_i < 80$	D+	$67 \leq g_i < 70$	F	$g_i < 60$
A	$93 \leq g_i < 97$	B	$83 \leq g_i < 87$	C	$73 \leq g_i < 77$	D	$63 \leq g_i < 67$		
A-	$90 \leq g_i < 93$	B-	$80 \leq g_i < 83$	C-	$70 \leq g_i < 73$	D-	$60 \leq g_i < 63$		

* Note: To receive an A+ you must have demonstrated significant contributions to the class in addition to achieving this numeric grade.

Communications:

ELMS - Official course site for materials, assignments, announcements, gradings, etc. Make sure that your email & announcement notifications (including changes in assignments and/or due dates) are enabled in ELMS so you do not miss any messages.

Emails - Administrative requests, quick clarifications, etc. Please prefix the subject line with [CCJS418E]. If you have not received a reply within 2 days, please email again.

Office Hours - Complex technical questions

Grading Structure

Assignment	Percentage %
3 Homework Assignments (10% each)	30%
5 Quizzes (2% each)	10%
Active Class Participation	5%
Midterm	25%
Final	30%
Total	100%

Course Outline (Subject to Change)

Week 1:

- Thu, Aug 29 (Lecture): Course Introduction and Overview of Data Analysis in Criminology

Week 2:

- Tue, Sep 3 (Lab): Introduction to Jupyter and the basics of Python
- Thu, Sep 5 (Lecture): Intro to probability / Python data structures and control flow

Week 3:

- Tue, Sep 10 (Lab): Practice with Python control structures / **Problem Set #1 Out**
- Thu, Sep 12 (Lecture): Predictive modeling / Functions and modules in Python

Week 4:

- Tue, Sep 17 (Lab): Practice with functions and modules
- Thu, Sep 19 (Lecture): Introduction to Pandas for data manipulation

Week 5:

- Tue, Sep 24 (Lab): Pandas data cleaning and merging exercises / **Problem Set #1 Due**
- Thu, Sep 26 (Lecture): Descriptive statistics with NumPy and Pandas

Week 6:

- Tue, Oct 1 (Lab): Data visualization with Seaborn / **Problem Set #2 Out**
- Thu, Oct 3 (Lecture): Crime pattern analysis and hotspot mapping techniques

Week 7:

- Tue, Oct 8 (Lab): Implementing hotspot mapping
- Thu, Oct 10 (Lecture): Exploratory data analysis

Week 8:

- Tue, Oct 15 (Lab): Identifying patterns, outliers, and anomalies in crime data / **Problem Set #2 Due**
- Thu, Oct 17 (Lecture): Social network analysis

Week 9:

- Tue, Oct 22 (Lab): No Class, Take-Home Midterm
- Thu, Oct 24 (Lecture): No Class, Take-Home Midterm

Week 10:

- Tue, Oct 29 (Lab): Implementing social network analysis
- Thu, Oct 31 (Lecture): Ethical considerations in criminological data analysis

Week 11:

- Tue, Nov 5 (Lab): Practice with measures of fairness / **Problem Set #3 Out**
- Thu, Nov 7 (Lecture): Text analysis of police reports and court documents

Week 12:

- Tue, Nov 12 (Lab): Applying text analysis
- Thu, Nov 14 (Lecture): No Class

Week 13:

- Tue, Nov 19 (Lab): Clustering / **Problem Set #3 Due**
- Thu, Nov 21 (Lecture): Intro Large Language Models

Week 14:

- Tue, Nov 26 (Lab): Project work and consultation
- Thu, Nov 28 (Lecture): No Class (Thanksgiving)

Week 15:

- Tue, Dec 3 (Lab): Final Project Presentation
- Thu, Dec 5 (Lecture): Final Project Presentation

Note: This is a tentative schedule, and subject to change – monitor the course ELMS page for current deadlines.

Resources & Accommodations

Accessibility and Disability Services

Students with disabilities should inform me of their needs at the beginning of the semester. Please also contact UMD's Accessibility and Disability Service (<https://counseling.umd.edu/ads/>). ADS will make arrangements with the student and me to determine and implement appropriate academic accommodations. Inclusion is one of the iSchool's core values, and we have attempted to make all materials and assignments accessible to people with varying abilities. However, if there is something else I can do to make the class more accessible please schedule a time to come talk to me. This will benefit not only yourself but also future students!

Getting Help

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit [UMD's Student Academic Support Services website](#) to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpening their communication skills (and improving their grade) by visiting [UMD's Writing Center](#) and schedule an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need ([UMD's Student Resources and Services website](#) may help). If you feel it would be helpful to have someone to talk to, visit [UMD's Counseling Center](#) or [one of the many other mental health resources on campus](#).

UMD Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit www.ugst.umd.edu/courserelatedpolicies.html for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.