

**47: 202: 421 Crime Mapping
3 Credits
Spring 2019**

**Monday and Thursday
1:00-2:20pm**

I. Course Information

Instructor Information:

Instructor: Alejandro Giménez-Santana, PhD
Classroom: ENG 309
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Office Hours: By appointment

Course Overview:

This course provides a practical introduction to analyzing and mapping crime and other public safety data using open-sourced and web-based applications, as well as ArcGIS geographic information system (GIS) software. Students will learn skills to make and analyze maps and will develop a solid base upon which to build further expertise in crime mapping and GIS.

The course will incorporate diverse learning activities including lectures, PowerPoint presentations, instructor-led skills training, and student practice sessions. Hands-on skills training will "walk" students through a series of tasks for GIS mapping and analysis. A "watch" and "follow" methodology will be employed. After watching the instructor demonstrate a technique, students will follow along in an effort to complete structured lessons. Lectures or structured discussions will focus around the daily class topic. Lessons will focus on using ArcGIS software to make maps and manage spatial data.

Prerequisite:

This course assumes no previous experience in the use of geographic information systems (GIS). The basic ability to use a desktop computer and Microsoft Word and Excel applications is required.

B.S., Criminal Justice Program Learning Goals

Upon completion of the B.S. in Criminal Justice at Rutgers University-Newark, students should be able to:

- 1) Describe the development and functions of major criminal justice institutions (e.g., police, courts, corrections, and juvenile justice), the activities of actors within these institutions, and how they relate to one another as well as the broader social, political, and economic world.
- 2) Describe the mechanisms, correlates, theoretical underpinnings, and situational contexts of crime, criminal behavior and opportunity, and techniques for prevention and treatment.
- 3) Apply and analyze theories related to the policies and practices of the criminal justice system and its major institutions.
- 4) Demonstrate the ability to gather, explain, and apply empirical research in the field of criminal justice.
- 5) Obtain a comprehensive knowledge about the process of conducting criminal justice research, and develop the skills to conduct criminal justice research with appropriate methodologies.

Course Learning Goals:

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

1. Develop the theoretical and practical skills necessary for studying crime in a geographic context.
2. Use computer-mapping software as a tool for examining crime in a variety of geographic settings.
3. Model geographic objects such as bounded areas (e.g., census tracts or service districts), specific locations (e.g., buildings or events such as crimes), and networks (e.g., streets).
4. Learn how to collect, manage and edit spatial data (including administrative records and self-collected data) for use with GIS.
5. Explore data sources for understanding the geography of crime.
6. Understand how crime mapping is being used in criminal justice agencies.
7. Begin to develop critical thinking skills for reviewing and interpreting finished maps.

Required Readings:

Caplan, J. M. (2010). GIS for Public Safety: An Annotated Guide to ArcGIS Tools and Procedures. Newark, NJ: Rutgers Center on Public Security. Available to download for free at goo.gl/strtVi

Course Requirements:

Students are **required** to read assigned readings before each class and be prepared for class discussions and assignments.

Course Structure:

Classroom learning is a group activity that depends upon everyone's full participation in order to succeed. Be prepared to begin class on time; silence or turn off and put away cell phones; read and be prepared to discuss homework; submit assignments on time; and assist fellow classmates.

This course relies heavily on ESRI's ArcGIS and QGIS software. For your convenience, ArcGIS software is available at the computer lab and instructions will be given on how to obtain a free trial version. Datasets will be provided as needed. Please note that datasets used in this course should not be shared or otherwise distributed to people outside of the course without written permission from the instructor. Datasets, assignments, grades, and other information will be posted on Blackboard.

II. Course Schedule (tentative):

Date	Class Topic	Required Readings	Assignments Due
<i>Week 1</i> 1/24	Review of syllabus Introduction to Crime Mapping	No Assignment	
<i>Week 2</i> 1/28	Thinking Spatially ArcGIS, QGIS, and other GIS-capable software	"Crime mapping: spatial and temporal challenges" - Ratcliffe	
1/31	Policing Models CompStat Evidence-Based Practice Risk Terrain Modeling	"The rise of evidence-based policing: Targeting, testing, and tracking" - Sherman	Lab 1 Due
<i>Week 3</i> 2/4	What is GIS? Types of GIS Data Map Symbolology Querying GIS Data	Ch. 1 and 2	
2/7	Map Layout & Design Elements Labeling Features	Ch. 3	

Week 4 2/11	Exporting Maps Inserting Maps into Word & PPT	"Risk Terrain Modeling"– Caplan et al.	
2/14	Map Projections What is a coordinate system? Base Maps Downloading Census Shapefiles	Ch. 4	Lab 2 Due
Week 5 2/18	Managing GIS-friendly Data Importing Excel Files		
2/21	Geocoding Addresses	Ch. 5	
Week 6 2/25	Displaying XY coordinates Adding XY Centroids to Points, Polygons or Lines		
2/28	Joining Tables Calculating Field Values	Ch. 6	Lab 3 Due
Week 7 3/4	Spatial Joins Aggregating point data	"Nonresidential crime attractors and generators elevate perceived neighborhood crime and incivilities" – McCord et al.	
3/7	Working with Attribute Tables Editing Attribute Data	Ch. 7	
Week 8 3/11	MIDTERM EXAM		
3/14	Editing Existing Shapefiles Creating New Shapefiles	Ch. 8	Lab 4 Due
3/18 – 3/21	SPRING BREAK – NO CLASS		
Week 9 3/25	ArcToolbox Buffers Geoprocessing Tools	Ch. 9	
3/28	Spatial Data Processing Tools (Dissolve, Clip, etc.) Symbolizing Buffers	"The role of neighborhood parks as crime generators" – Groff et al.	
Week 10 4/1	Density Raster Mapping	Ch. 10	
4/4	Symbolizing Raster Density Maps Neighborhood Statistics		Lab 5 Due
Week 11 4/8	Hotspot Analysis (Kernel Density)	"The utility of hotspot mapping for predicting spatial patterns of crime" – Chainey et al.	
4/11	Nearest Neighbor Analyst Spatial Autocorrelation Basics	Ch. 11	

Week 12 4/15	Identifying Spatial Contexts of Social Disorganization	“Risk Terrain Modeling and Socio-Economic Stratification” – Giménez-Santana et al.
4/18	Mapping for your Audience Applications of GIS in Criminal Justice	
Week 13 4/22	Student Presentations	
4/25	Student Presentations	
Week 14 4/29	Student Presentations	
5/2	Student Presentations	
Week 15 5/6	Student Presentations	
5/9	<u>NO CLASS</u>	
Final Exam Week 5/13	<u>NO CLASS</u> <u>FINAL PROJECT DUE!</u>	

III. Course Assessment and Grading

The final grade will be assessed based upon your performance on the following:

Assignment Description	Linked to SLO	% of Course grade
Assignment #1 Term Project	SLO #1 and 2	30%
Assignment #2 Midterm Exam	SLO #1 and 2	30%
Assignment #3 Lab Assignments	SLO #1	20%
Assignment #4 Class Presentation	SLO #2 and 5	10%
Assignment #5 Classroom Attendance and Participation	SLO #1-5	10%

TERM PROJECT (30%): This project is intended to measure your applied understanding of the major skills and concepts presented in class—in a format that is less structured than lab assignments.

- a. **Think of at least two related spatial questions** (in any topic of interest to you) that are spatial in nature and that can be answered using a GIS. For example, “Are the parolees on my caseload mostly violent offenders?” is NOT a spatial question; “How are the violent offenders on my caseload *distributed* throughout my jurisdiction?” IS a spatial question. *Example spatial questions:*
- Does the location of toxic waste sites overlap with poorer communities?
 - How are crimes distributed or clustered in the jurisdiction?

- *Can police districts be re-drawn in a better way?*
 - *Are social services easily accessible to parolees?*
 - *Where should an early childhood education program be located?*
- b. Find (or create) all necessary datasets/shapefiles** to use in a GIS to answer your questions. Use base layers as appropriate.
- c. Produce several final maps** using sound cartographic principles.
- Use at least 1 tool located in either the “Spatial Analysis” OR the “Spatial Statistics” Toolboxes (ArcGIS).
- d. Produce a report** that discusses the research questions, methods, and results in a way that would allow anyone with basic GIS skills to replicate your analysis. It should be submitted in (color) PDF format by email to the instructor. An additional set of maps should be submitted in (grayscale) JPG or PDF format. Hardcopies of both sets of deliverables should be submitted to the instructor.

MIDTERM EXAM (30%): There will a midterm exam during this course. The exam will be based on the course readings and lecture materials. The exam will not cover the hands-on application of GIS.

LAB ASSIGNMENTS (20%): Labs will require you to demonstrate a combination of analytical and technical skills. These will include textbook exercises and other lab assignments. There will be five (5) lab assignments throughout the semester. Each lab assignment will count 4 points (4%) towards your final grade. They should be submitted to the instructor by the beginning of class on the day in which they are due. **If you do not submit labs on time, you will get a zero.** Each lab assignment will be graded objectively.

CLASS PRESENTATION (10%): Give a PowerPoint presentation, with no more than 10 slides (number your slides), of your Term Project. You will have 10 minutes to present your project to the class. The presentation is an opportunity for everyone to learn about applying GIS to unique topic areas and for you to get constructive feedback.

Presentation Guideline:

1. What were your research questions? Explain why GIS was required to answer them.
2. Where did you get your data? Was cleaning and/or manipulating the data required?
3. How was ArcGIS used to produce your maps? Discuss the steps necessary to re-produce each map.
4. For each map, discuss: 1) The result/information that you intend the map to communicate (i.e. What should the map communicate to the reader? What is the map’s intended purpose?); 2) Your interpretation of the map.
5. Conclude with brief answers to your research questions. Every final map that you produce should have a clear purpose—specifically, to help communicate answers to your questions. Map images, titles and other design elements should, as a whole, clearly communicate the intended information to the reader. Your commentary should supplement that.
6. You will be graded, in part, on how clearly and effectively the maps support your conclusions, communicate their intended information, and fulfill their intended purposes.

ATTENDANCE and PARTICIPATION (10%): Attendance is VERY IMPORTANT and may count toward your final grade. You will be more successful if you attend.

The following grading scale will be used for this course:

A	90–100%
B+	85-89%
B	80-84%
C+	75-79%
C	70-74%
D	60-69%
F	<60%

Late or Missing Assignment Policy

Make-up exams and late papers will be allowed only in extenuating circumstances and with prior approval of the instructor. This means to contact me ahead of time. In the case of an emergency or an unavoidable absence, I expect you to contact me as soon as possible and provide written documentation once you have returned. If you know in advance that you will be missing class the day of an exam, please see that you schedule a make-up date as soon as possible. It is YOUR RESPONSIBILITY to catch up. All Lab assignments submitted after the deadline will receive a 0 grade, unless your absence is properly justified (e.g., sickness, etc.).

IV. COURSE POLICIES

Classroom rules

All members of this class are required to conduct themselves in an appropriate and professional manner. Laptops are permitted only if disengaged from the internet and other electronic devices should be stored away unless you specifically seek the instructor's permission. In this class, we may have discussions that challenge our taken for granted assumptions about crime and justice. Students should be prepared to engage honestly and openly about this material and perhaps even examine their own beliefs about the issues. While I am hopeful that the course materials will spark interesting discussion, personal insults or other types of demeaning, disrespectful, or threatening comments toward other class members about their experiences, backgrounds, or statements will NOT be tolerated. All forms of plagiarism (including self-plagiarism) will not be allowed and will result in an F grade for this course.

Academic Integrity

As a member of the Rutgers University community you are not to engage in any academic dishonesty. You are responsible for adhering to basic academic standards of honesty and integrity as outlined in the Rutgers University Policy on Academic Integrity for Undergraduate and Graduate Students <http://studentconduct.rutgers.edu/academic-integrity>. Your academic work should be the result of your own individual effort, you should not allow other students to use your work, and you are required to recognize and reference any material that is not your own. Violations of the university's policy will result in appropriate action.