

1:573:233 | Fundamentals of Environmental Geomatics Laboratory

Rutgers, the State University of New Jersey
School of Environmental and Biological Sciences
Fall 2022 – 1 Credit

Meeting Place: Room 129, Blake Hall

Meeting Time: Section 01: Monday, 3:50 p.m. – 5:10 p.m.
Section 02: Wednesday, 5:40 p.m. – 7:00 p.m.

Instructor: Dave Smith
Office: Room 224, Blake Hall
Email: dave.c.smith@rutgers.edu
Office Hours: TBA

Course Website: CANVAS "GEOMATICS LAB (SEC#) FA22"
Section 1: <https://rutgers.instructure.com/courses/193382>
Section 2: <https://rutgers.instructure.com/courses/193386>

Textbook: There is no required text for this course. All course materials will be provided.

This course is REQUIRED for the *BSLA* and *Environmental Planning* programs. It is also required for the *Environmental Geomatics Certificate* and *Minor* programs.

Course Learning Objectives

1. Perform basic functions and apply tools for visualizing, manipulating, analyzing, and generating spatial datasets in ArcGIS.
2. Apply these tools together to perform complex spatial analysis of real-world environmental phenomena.
3. Understand and explain role of individual tools, datasets, and variables within a given analysis.
4. Follow a detailed written protocol.

Course Description:

This course focuses on providing hands-on experience with the GIS tools and methods presented in the Fundamentals of Environmental Geomatics lecture course. The intention of the lab is to supplement the lecture material, which provides a vital understanding of the conceptual framework for these tools and a broader context for how they are used.

Course Structure:

Typically, each class will begin with a short presentation that introduces the current week's topic. You will then follow the step-by-step lab handout at your own pace—the instructor will be there to provide assistance when needed. Finally, each week, there will be an assignment in which you will be expected to apply the skills you have learned in that week's lab on your own.

At the end of the term, there will be a special “synthesis” lab designed to test your understanding and ability to independently apply the tools and concepts that you have learned up to that point. In this lab, you will be given a specific GIS task to accomplish without detailed instructions. While an added challenge, the synthesis lab is not an exam, and students are invited to use any appropriate resources including past lab handouts, the Internet, and their instructor.

COVID-19 Precautions and Policies:

Despite the high rate of vaccination among our campus community, and the significant protection that vaccines provide, COVID-19 remains a very real threat. This is particularly true for members of our community who cannot be vaccinated or who have family members at home who cannot be vaccinated.

For that reason, and in keeping with university policy, please be sure to follow these standard guidelines.

1. If you feel unwell, **DO NOT come to class**. As discussed in the attendance policy below, I will work with you to make up any work that you miss due to excused absence.
2. All students and employees are expected to **wear a mask that fully covers the mouth and nose** at all times while inside campus buildings. Please avoid using masks with exhaust valves (these do not prevent disease-causing particles and aerosols from passing out of the mask, increasing the risk of you making others sick). See CDC guidelines for appropriate mask types and care here: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>
3. **Maintain distance from classmates**. Avoid sitting directly next to other students. Allow other students space while entering and exiting the classroom, etc.
4. **Wash or sanitize hands thoroughly** before and after class.

Again, these guidelines should be followed **regardless of vaccination status**. I am fully vaccinated, and I will be following the same guidelines.

Grading:

Composition of Final Grade:

Weekly Labs:	65%
Synthesis Lab:	25%
Participation:	10%
Attendance:	See Below

Numerical Ranges for Letter Grades:

A:	90-100%		
B:	80-86%	B+:	87-89%
C:	70-76%	C+:	77-79%
D:	60-69%		
F:	under 60%		

Attendance Policy:

Students are expected to attend all lab sessions. This is particularly important for this course. The material we cover is cumulative, so missing a lab session will make it more difficult to follow along the next time.

Absences may be excused in cases of illness, family emergency, or organized professional development events (e.g., conferences). Where possible, let your instructor know in advance of your absence so that we can arrange to cover any material you miss. If advance notice is not possible, inform your instructor in writing within seven days of returning to campus. **Any material missed during an unexcused absence will be the responsibility of the student.**

More than two unexcused absences will result in a 10% reduction in your final grade for the course. Each additional two unexcused absences will result in a further step reduction in your final grade for the course.

Participation Policy:

- You are expected to arrive to class on time and to stay for the duration of the class period (or until finished with the in-class section of the assignment).
- While students are strongly encouraged to ask questions, you are expected show a concerted effort to follow and understand the written instructions.
- Similarly, while you may discuss the lab instructions with other students, distracting others from their work with excessive questions is not acceptable.
- You are expected to show respect for your classmates and instructor at all times. Deliberately distracting, offensive, or confrontational behavior will not be tolerated.
- You are expected to attend only the scheduled meeting time of section for which you are registered, unless given specific permission in advance to attend the meeting of another section.
- **You are expected to adhere to *all* of the above COVID-19 guidelines.**

Late Submission Policy:

All assignments are due at the beginning of the following lab session, unless otherwise noted.

- ***Any lab submitted less than one week late will be docked 5 points.***
- ***Weekly labs submitted more than one week late will be docked an additional 10 points.***
- ***Synthesis labs submitted more than one week late WILL NOT BE ACCEPTED.***

Academic Integrity Policy:

While students are allowed to discuss and collaborate on exercises and assignments within reasonable limits, **all submitted work must be the individual work of the student submitting it.** If any student is caught submitting work completed by another student, both will receive a grade of 0 for that assignment. For a second infraction of this rule, the offending student will be reported to the administration for further discipline.

The University's Policy on Academic Integrity can be found at: <http://academicintegrity.rutgers.edu/>.

Use of the Computer Lab:

Some work outside of class will generally be necessary. It is recommended that you use the university's **Virtual Computer Lab** system to access the necessary tools remotely for out-of-class work. This will give you greater flexibility and reduce the time you need to spend in the lab. You may also choose to use the lab to work on homework any time it is open, and **no class is being held**. A schedule of lab hours will be posted outside of the lab and on Canvas.

Whether during class or outside of class time, standard computer lab rules and common sense apply:

- ***All COVID-19 guidelines must be followed even outside of class time.***
- No food or open drinks are allowed in the lab.
- Do not leave any logged in computers unattended.
- Clean up your desk before leaving.
- Be respectful of others working in the lab.
- Do not attempt to install any software on any computer in the lab.
- Report any malfunctioning computers to your instructor as soon as possible.

Class Schedule

WEEK	LAB EXERCISE
1	Introduction/Setting Up
2	Introduction to ArcGIS
3	Basic Cartography Tools
4	More Cartography tools
5	Data Storage and Portability
6	Working with Tables
7	Spatial Analysis Concepts
8	Analysis of Vector Data
9	Analysis of Raster Data
10	Representation and Analysis of Terrain Data
11	Data Sources and Data Transfer
12	Geocoding and Heads-Up Digitizing
13	Synthesis Lab