11:573:233| Fundamentals of Environmental Geomatics Laboratory

Rutgers, the State University of New Jersey
School of Environmental and Biological Sciences
FALL 2023 – 1 Credit

Meeting Place: Room 237, Environmental and Natural Resources Building (ENR 237)

Meeting Time: Section 1: Mondays, 3:50 p.m. – 5:10 p.m.
Section 2: Wednesdays, 5:40 p.m. – 7:00 p.m.

Instructor: **Dave Smith** | Email: dave.c.smith@rutgers.edu

Office Hours: TBA

Course Website: CANVAS "GEOMATICS LAB (SEC#) FA23"

Prerequisites: There are no prerequisites for this course. However, it is strongly recommended that students take **both** the lecture and the lab course during the same semester.

Textbook: There is no required text for this course.

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 using ArcGIS Pro software.
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.

*This is a **lab course,** and while there will be some explanation of the tools and methods work with, this will be limited. **It is strongly recommended that students also take the accompanying lecture course (11:573:232)** to get a more complete understanding of how these tools and methods work and the general context of their use.*

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. Students will then follow a self-paced written lab tutorial. The instructor will be there to help when needed. Finally, each week, there will be an assignment in which students will be expected to apply the skills they have learned in that week's lab with minimal direction.

Grading:

Composition of Final Grade:		Numerical Ranges for Letter Grades:			
Weekly Labs:	90%	A:	90-100%		
Participation:	10%	B:	80-86%	B+:	87-89%
Attendance:	See Below	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 tutorial).
- 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.

Late Submission Policy:

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

- *Any assignment submitted less than one week late will be docked 10 points.*
- *Weekly lab assignments submitted more than one week late will be docked an additional 10 points.*
- *Weekly lab assignments submitted more than two weeks late will be accepted only with the instructor's approval.*

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/*.

Access to Computing Resources:

Some work outside of class will generally be necessary. You may choose to use the teaching 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.

ArcGIS Pro is also available for download through the university's software portal. However, be aware that *ArcGIS is available for Windows only*. Mac users will need to use either the physical computer lab or the Rutgers Virtual Computer Lab system for work outside of class.

All necessary data will be available directly through the cloud using Box. You should be able to switch seamlessly between computers without needing to upload, download, or sync data.

Whether during class or outside of class time, standard computer lab rules and common sense apply when in the teaching lab:
- 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.
- *You are **NOT** free to use the lab while another class is being held.*

Class Schedule
The following is a list of topics that will be covered throughout the semester.
- Lab 0:   Setting Up
- Lab 1:   Introduction to ArcGIS Pro
- Lab 2:   Mapping Categorical Data and the Map Layout
- Lab 3:   Mapping Statistical Data
- Lab 4:   Basic Map Design Concepts
- Lab 5:   Understanding GIS Data
- Lab 6:   Spatial Analysis Concepts
- Lab 7:   Working with Tables and Attribute Data
- Lab 8:   Analysis of Vector Data
- Lab 9:   Analysis of Raster Data
- Lab 10:   Terrain Representation and Analysis
- Lab 11:   Data Sources and Data Transfer
- Lab 12:   Geocoding and Heads-Up Digitizing