1:573:233| Fundamentals of Environmental Geomatics Laboratory

Rutgers, the State University of New Jersey
School of Environmental and Biological Sciences
Spring 2020

Meeting Place: Room 237A, Environmental and Natural Resources Building (CRSSA Teaching Lab)
Meeting Time: Section 01: Monday, 3:55 p.m. – 5:15 p.m.
Section 02: Monday, 2:15 p.m. – 3:35 p.m.
Section 03: Wednesday, 2:15 p.m. – 3:35 p.m.
Section 04: Friday, 2:15 p.m. – 3:55 p.m.
Section 05: Tuesday, 5:35 p.m. – 6:55 p.m.

Credits: 1

Instructors: Dave Smith (Sections 2, 3, and 5)
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Office Hours: TBA

John Hayton (Sections 1 and 4)
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Office Hours: TBA

Course Website: *https://canvas.rutgers.edu/* -- course site is listed as "GEOMATICS LAB (SEC#) SP20"

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:

Geomatics is a rapidly growing field that has applications in a wide array of different disciplines including urban and environmental planning, ecological analysis and modeling, epidemiology, and emergency response and management to name just a few. It incorporates Geographic Information Systems (GIS), Remote Sensing, and Global Navigation Satellite Systems like GPS, along with other spatial sciences.

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.

Readings:
There are no required readings for this course.

Course Structure and Learning Objectives:
The purpose of the course is to introduce students to ArcGIS software and some of the basic geoprocessing and analytical tools that it provides. The table below shows the specific topics covered in each lab.

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.

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

LAB	TOPIC
1	Introduction to ArcGIS
2	Basic Cartography Tools
3	More Cartography tools
4	Data Storage and Portability
5	Working with Tables
6	Analysis of Vector Data
7	**Synthesis Lab I**
8	Analysis of Raster Data
9	Data Sources and Data Transfer
10	Geocoding and Heads-Up Digitizing
11	Tools for Improved Efficiency
12	**Synthesis Lab II**
13	Introduction to ArcGIS Pro

Grading:

Composition of Final Grade:

Weekly Labs:	55%
Synthesis Lab I:	15%
Synthesis Lab II:	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 step 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 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. 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:
Again, because the material we cover is cumulative, it is important to complete the previous week's assignment before we start on the next topic in order to avoid falling behind. ***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 10 points.***
- ***Any lab 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/academic-integrity-policy/

Use of Computer Lab:

While there will typically be time to work independently on the week's assignment during each lab session, some work outside of class will generally be necessary. You are welcome to use the lab 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 the Sakai site.

While working in the lab, standard computer lab rules and common sense apply:
- No food or open drinks are allowed in the lab.
- Clean up your desk before leaving.
- Be respectful of others working in the lab.
- Do not leave any logged in computers unattended.
- Do not attempt to install any software on any computer without express permission from your instructor.
- Report any malfunctioning computers to your instructor as soon as possible.