

16:550:545 | Introduction to Geomatics

Rutgers, the State University of New Jersey
School of Environmental and Biological Sciences
SPRING 2017

Meeting Place: Room 129, Blake Hall

Meeting Times: Tuesday, 12:35 PM – 1:55 PM
Friday, 12:35 PM – 1:55 PM

Credits: 3

Instructor: Dave Smith

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Office Hours: by appointment

Course Website: <https://sakai.rutgers.edu> -- course site is listed as "Intro to Geomatics Sp17"

This course fulfills the geomatics requirement for students in the Masters of Landscape Architecture program.

Course Learning Objectives:

1. Become familiar with a variety of techniques for the collection, management, representation, and analysis of geospatial data.
2. Be able to apply these techniques to carry a geomatics-based project or study from proposal to completion.

Course Description:

Geomatics is a rapidly growing field that has applications in a wide array of different disciplines including landscape architecture, 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 (*e.g.* GPS), along with other spatial sciences. The reason for the growing popularity and broad appeal of Geomatics is simple: if the location of the thing you are asking about is meaningful to the question you are asking, then chances are that Geomatics provides the best tools for finding the answer. This course provides hands-on experience with some of the tools and methods commonly used by Geomatics professionals as well as the theoretical principals that underlie them.

Prerequisites:

This course has no formal prerequisites. However, students are expected to have basic computer skills and a general understanding of spatial concepts. Students who do not feel comfortable in either one of these areas will need to work outside of class to develop those skills.

Readings:

There is no required text for this course. However, mandatory readings will be provided as assigned.

Course Structure:

This course is divided into five general areas of focus (1) an introduction to GIS and geospatial data, (2) data representation, (3) data analysis, (4) data collection, and (5) practical application. The course will cover some lecture material, but will focus primarily on providing hands-on experience through labs. There will be an assignment due at the beginning of each class session.

Additionally, students will be expected to complete an independent term project. Each student will define a research question to explore using geomatics tools and methods. You will acquire the necessary data, apply appropriate analytical methods, and interpret your results. At the end of the semester, you will be expected to present your work in a brief poster presentation along with a formal written report.

Grading:

Lab Assignments:	50%
Midterm Exam:	15%
Term Project:	35%

Attendance Policy:

The Department of Landscape Architecture's policy on attendance, as outlined in the student handbook, states:

The individual student's development as a landscape architect is largely dependent upon two aspects of education. First is the exposure to and assimilation of a body of information which relates to the field. Second is the application of this knowledge through studio projects and problem-solving skills developed through critiques, reviews and interactions during each project.

*The Rutgers Landscape Architecture curriculum is designed to develop both areas. Attendance and participation in all lectures and studios are essential if the student is to achieve his/her maximum potential. **More than three unexcused absences will result in a step reduction in your semester grade. Each additional three absences will result in another step reduction.***

A minimum level of participation is defined as being in attendance for the entire duration of a class session. It is the student's responsibility to be in attendance at all required classes and all personal plans should be made in accordance with the schedule

Ownership of Student Work:

The Rutgers Department of Landscape Architecture maintains a permanent archive of student work. While you will retain authorship and intellectual property rights, all completed and submitted assignments belong to the department with full permission for the department to publish and publicize the work.

Academic Integrity Policy:

Students will be held to the University's Policy on Academic Integrity, which can be found at: <http://academicintegrity.rutgers.edu/policy-on-academic-integrity>

Tentative Course Schedule:

Week	Tuesday		Friday	
1	17-Jan	Introduction (lecture)	20-Jan	Intro to ArcGIS (Lab)
2	24-Jan	GIS Data and Data Models (Lecture)	27-Jan	Data Storage and Portability (Lab)
3	30-Jan	Cartography and Data Representation (Lecture)	3-Feb	Basic Cartography in ArcGIS (Lab)
4	7-Feb	Map Design (Lecture)	10-Feb	Map Design (Lab)
5	14-Feb	Working with Attribute Tables (Lecture)	17-Feb	Working with Attribute Tables (Lab)
6	21-Feb	Basic Vector Analysis (Lecture/Lab)	24-Feb	Complex Vector Analysis (Lab)
7	28-Feb	Basic Raster Analysis (Lecture/Lab)	3-Mar	Terrain Analysis and Viewsheds (Lecture/Lab)
8	7-Mar	Analyzing Distance and Movement (Lecture/Lab)	10-Mar	Developing a GIS Analysis (Lecture)
9	14-Mar	Spring Break	17-Mar	Spring Break
10	21-Mar	Complex Analysis (Lab)	24-Mar	Data Collection (Lecture)
11	28-Mar	Geocoding and Digitizing (Lab)	31-Mar	The Collector App (Lab)
12	4-Apr	Data Management (Lecture)	7-Apr	Tools for Improved Workflow (Lab)
13	11-Apr	Relevance, Uncertainty, and Critical Thinking (Lecture)	14-Apr	Project Work Session
14	18-Apr	Project Work Session	21-Apr	Project Work Session
15	25-Apr	Project Work Session	28-Apr	Final Project Presentations FINAL REPORT DUE