

Ecological Analysis with Geographic Information Systems
BIOL-UA 64 or ENVST-UA 372
Lab: Mon & Wed 11:00am to 12:15pm
Lecture: Wed 9:30am to 10:45am

Professor Mary Killilea's Contact Information:

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Office Hours: Wednesday 12:30-1:30

Course description:

Being able to organize and analyze ecological data is an essential research tool. Geographic information systems (GIS) are computerized systems for the capture, storage, management, analysis and display of geographically referenced data and their attributes. In this course, you will learn the basic principles and applications of GIS including coordinate systems, data transformations, spatial analysis, and accuracy assessment. Laboratory exercises will use ecological data and examples to provide extensive hands-on experience with ArcGIS a professional GIS software package.

Additional course goals:

During the semester, we will be reading a series of scientific articles to help hone your critical reading skills. This is an essential part of your scientific training. It will also help you develop an independent research project. Additionally, you will receive training on how to write a scientific paper and present the results of your research project. As part of your training to write scientific papers.

Prerequisites:

Principles of Biology II or Environmental System Science

Grades:

The final grade for the class will be calculated as follows:

Weekly lab assignments	10%
Independent Project	40%
Objective and Bibliography (5)	
Proposal (10)	
Paper (15)	
Presentation (10)	
Midterm	25%
Final	25%

An **unexcused** absence from an exam will be calculated as 0% for that particular test!

If you miss an exam and present a legitimate excuse, a make-up test will be made available to you. There will be only one opportunity for such an exam; it could be an essay test, and the appropriate instructors will grade it. This situation will be dealt with partly on an individual basis.

Once a grade has been posted you have one week to contact me about your grade on any assignments or exams.

Academic Integrity:

Students are expected to know and understand the policies on academic integrity, including University and CAS policies: <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html> ; <https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html>

If a student is caught cheating or plagiarizing, the Instructor may, at her or his discretion, give the student an academic sanction, which may include a warning and/or reduction of the grade on an assessment item (e.g. exam) or even the final course grade (in consultation with the Director of Undergraduate Studies, who may meet with the faculty and the student to discuss the nature of the offense). Depending on the severity of the infraction, this could even mean failure of the student in the course. The student may appeal any grade reduction to the Director of Undergraduate Studies. The departmental decision is final. In addition, any substantial case brought to the Director of Undergraduate Studies must be referred to the Dean's office for possible disciplinary action.

If you have any questions or uncertainties about these policies, please consult the Instructor, Director of Undergraduate Studies, or Dean's office.

Disability Disclosure Statement:

Academic accommodations are available to any student with a chronic, psychological, visual, mobility, learning disability, or who is deaf or hard of hearing. Students should please register with the Moses Center for Students with Disabilities at [212-998-4980](tel:212-998-4980).

Required Texts and Readings:

Bolstad, Paul (2019) *GIS Fundamentals: A First Text on Geographic Information Systems, 6th Edition* https://www.xanadu.com/higher-education/educators/custom-books-catalog/gis_fundamentals_6e/

Class schedule

	Topics	Readings <i>Should be completed before Wednesday morning</i>
Week 1 <i>1/27 & 1/29</i>	Discussion: Introduction to GIS; Introduction to data models Lab: Getting Started with GIS	Bolstad, Chapters 1 and 2
Week 2 <i>2/3 & 2/5</i>	Discussion: Map Projections and Coordinate Systems Lab: Map Projections	Bolstad, Chapter 3

Week 3 <i>2/10 & 2/12</i>	Discussion: Maps, Data Entry, Editing and Output Lab: Importing Tables	Bolstad, Chapters 4 & 7
Week 4 <i>2/17 & 2/19</i> No Class on Monday 2/17	Discussion: Writing a proposal Lab: Project Discussion	Objective and Bibliography due Feb 19
Week 5 <i>2/24 & 2/26</i>	Discussion: Finding GIS Data and Data Management Lab: Collecting GIS Data	
Week 6 <i>3/2 & 3/4</i>	Discussion: Global Navigation Satellite Systems and Aerial and Satellite Images Lab: Remote sensing	Bolstad, Chapters 5 & 6 Proposal Draft due March 4
Week 7 <i>3/9 & 3/11</i>	Midterm (Wednesday 3/11 at 9:30am) Lab: Project work	
Week 8 <i>3/16 & 3/18</i>	Spring Break No Class	
Week 9 <i>3/23 & 3/25</i>	Discussion: Spatial Analysis Lab: Spatial Analysis	Bolstad, Chapter 9 Proposal due March 25
Week 10 <i>3/30 & 4/1</i>	Discussion: Raster and Terrain Analysis Lab: Raster and Terrain Analysis	Bolstad, Chapters 10 and 11
Week 11 <i>4/6 & 4/8</i>	Discussion: Writing a scientific paper Lab: Project work	
Week 12 <i>4/13 & 4/15</i>	Discussion: Spatial Estimation and Spatial Models Lab: Spatial Modeling	Bolstad, Chapter 12 and 13

Week 13 <i>4/20 & 4/22</i>	Discussion: Data Standards and Data Quality – Semester Review Lab: Project work	Bolstad, Chapter 14 Paper Draft Due April 22
Week 14 <i>4/27 & 4/29</i>	Final (Wednesday 4/29 at 9:30am) Lab: Paper feedback and How to prepare a presentation	
Week 15 <i>5/4 & 5/6</i>	Discussion: Class Presentations Lab: Class Presentations	
Week 16 <i>5/11</i>	Lab: Class Presentations	Paper Due May 13
