Undergraduate Course Syllabus

GEO 450: Spatial Analysis

Center: Online

Course Prerequisites

GEO-345

Course Description

This course will investigate geospatial statistical analyses that aim to provide students with the background necessary to investigate geographically represented data. The specific focus will be on spatial data analysis, such as the analysis of autocorrelation, principles of geostatistics and analysis methods that are relevant in the fields of public health, environmental/earth science and social science. The focus of this course will be to gain hands-on experience in applying these techniques with Geographic Information Systems (GIS) and spatial analytical software, and essential methodological and practical issues that are involved in sophisticated spatial analyses.

Course Outcomes

- Manipulate geographic data to derive information for spatial analysis applying geographic information system methodologies
- Assess vector-based data layers for isolating spatial relationships between discrete geographic data sets
- Assess raster-based data layers for isolating spatial relationships between continuous geographic data sets
- Determine appropriate geostatistical methodologies for interpolating spatial values of targeted unsampled areas
- Create cartographic reports for depicting map building, analysis methodology, and confidence in statistical analysis results

Required Materials

Using your learning resources is critical to your success in this course. Please purchase directly through the SNHU Online Bookstore rather than any other vendor. Purchasing directly from the bookstore ensures that you will obtain the correct materials and that the IT Service Desk, your advisor, and the instructor can provide you with support if you have problems.

The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns & Relationships
Andy Mitchell
ESRI Press
2nd Edition
2020

ISBN :978-1-58948-579-2

The ESRI Guide to GIS Analysis, Volume 2: Spatial Measurements and Statistics
Andy Mitchell
ESRI Press
2nd Edition
2021
ISBN: 978-1-58948-608-9

The ESRI Guide to GIS Analysis, Volume 3: Modeling Suitability, Movement, and Interaction
Andy Mitchell
ESRI Press
1st Edition
2012
ISBN: 978-1-58948-305-7

Software Requirement
This course requires use of SNHU's virtual desktop (VDI) environment. Directions to access the VDI are available here: VDI Instructions.

Diversity, Equity, and Inclusion
As indicated in our core values, SNHU is committed to "embrace diversity where we encourage and respect diverse identities, ideas, and perspectives by honoring difference, amplifying belonging, engaging civilly, and breaking down barriers to bring our mission to life."

This may or will be reflected in SNHU's curriculum as we embrace and practice diversity, equity, and inclusion (DEI) to provide the most transformative experience for our students, faculty, and staff. Because topics pertaining to DEI can be sensitive, please remember that embodying and practicing diversity, equity, and inclusion is one of our core values that you will encounter throughout the academic experience. In higher education, we are expected to think and engage critically. Use a growth mindset to embrace the diverse readings, course assignments, and experiences of your peers and faculty.

For more information about DEI at SNHU, please visit our website at the Office of Diversity and Inclusion.

Instructor Availability and Response Time
Your class interaction with the instructor and your classmates will take place on a regular, ongoing basis. Your instructor will be actively engaged within the course throughout the week. You will normally communicate with your instructor in the weekly discussions or the General Questions discussion topic so that your questions and the instructor's answers benefit the entire class. You should feel free, however, to communicate with your instructor via SNHU email at any time, particularly when you want to discuss something of a personal or sensitive nature. Your instructor will generally provide a response within 24 hours. Instructors will post grades and feedback (as applicable) within seven days of an assignment's due date, or within seven days of a late submission.

Grade Distribution

Assignment Category	Number of Graded Items	Point Value per Item	Total Points
Discussions	4	25	100
Journals	4	30	120
Exercises	6	55	330
Final Project			
Milestone One	1	50	50
Milestone Two	1	50	50
Milestone Three	1	50	50
Final Submission	1	300	300
			Total Course Points: 1,000

This course may also contain practice activities. The purpose of these non-graded activities is to assist you in mastering the learning outcomes in the graded activity items listed above.

University Grading System: Undergraduate

Grade	Numerical Equivalent	Points
A	93–100	4
A-	90–92	3.67
B+	87–89	3.33
B	83–86	3
B-	80–82	2.67
C+	77–79	2.33
C	73–76	2
C-	70–72	1.67
D+	67–69	1.33
D	60–66	1
F	0–59	0
I	Incomplete	
IF	Incomplete/Failure *	
IP	In Progress (past end of term)	
W	Withdrawn	

* Please refer to the policy page for information on the incomplete grade process.

Grading Guides

Specific activity directions, grading guides, posting requirements, and additional deadlines can be found in the Assignment Guidelines and Rubrics section of the course.

Weekly Assignment Schedule

All reading and assignment information can be found within each module of the course. Assignments and discussion posts during the first week of each term are due by 11:59 p.m. Eastern Time. Assignments and discussion posts for the remainder of the term are due by 11:59 p.m. of the student's local time zone.

In addition to the textbook readings that are listed, there may be additional required resources within each module.

Module	Topics and Assignments
1	Vector Analysis *The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns & Relationships*, Chapters 1, 2, and 6 1-1 Discussion: Defining Spatial Analysis 1-2 Exercise Set-Up (Non-graded) 1-3 Exercise I: Vector Analysis Through Geoprocessing 1-4 Final Project: Review
2	Vector Attribute and Data Analysis *The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns & Relationships*: Chapters 3 and 5 2-1 Exercise II: Vector Data Analysis Through Attribute Classification 2-2 Final Project Milestone One: State Identification and Vector Data Analysis
3	Site Selection Using Raster Analysis *The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns & Relationships*, Chapter 4 *The ESRI Guide to GIS Analysis, Volume 3: Modeling Suitability, Movement, and Interaction*, Chapter 1 3-1 Exercise III: Raster Analysis Through Reclassification 3-2 Begin Work: Exercise IV: Raster Analysis Through Map Algebra and Overlays 3-3 Journal: Vector and Raster Analysis Today
4	Raster Analysis Methods *The ESRI Guide to GIS Analysis, Volume 3: Modeling Suitability, Movement, and Interaction*, Chapters 2 and 3 4-1 Discussion: Remote Sensing Data 4-2 Submit: Exercise IV: Raster Analysis Through Map Algebra and Overlays 4-3 Final Project Milestone Two: Raster Data Analysis
5	Exploring Data Through Spatial Statistics *The ESRI Guide to GIS Analysis, Volume 2: Spatial Measurements and Statistics*, Chapters 1 and 2 5-1 Journal: Application of Spatial Analysis 5-2 Exercise V: Statistical Analysis 5-3 Begin Work: Exercise VI: Spatial Interpolation and Density Assessment
6	Spatial Interpolation *The ESRI Guide to GIS Analysis, Volume 2: Spatial Measurements and Statistics*, Chapter 3 6-1 Submit: Exercise VI: Spatial Interpolation and Density Assessment 6-2 Journal: Interpolation Techniques 6-3 Final Project Milestone Three: Geostatistical Analysis

Module	Topics and Assignments
7	Advanced Spatial Analysis Techniques *The ESRI Guide to GIS Analysis, Volume 2: Spatial Measurements and Statistics*, Chapters 4 and 5 7-1 Discussion: Geostatistical Analysis in the World 7-2 Final Project Submission: Cartographic Report Containing a Series of Maps and a Methodologies Summary
8	Spatial Analysis in the Real World 8-1 Discussion: Spatial Analysis Today 8-2 Journal: The Future With Spatial Analysis

Attendance Policy

Online students are required to submit a graded assignment/discussion during the first week of class. If a student does not submit a graded assignment/discussion during the first week of class, the student is automatically dropped from the course for non-participation. Review the full attendance policy.

Late Assignments Policy

Meeting assigned due dates is critical for demonstrating progress and ensuring appropriate time for instructor feedback on assignments. Students are expected to submit their assignments on or before the due date. Review the full late assignment policy.

SNHU Student Handbook

Review the student handbook.

ADA/504 Compliance Statement

Southern New Hampshire University (SNHU) is dedicated to providing equal access to individuals with disabilities in accordance with Section 504 of the Rehabilitation Act of 1973 and with Title III of the Americans with Disabilities Act (ADA) of 1990, as amended by the Americans with Disabilities Act Amendments Act (ADAAA) of 2008.

SNHU prohibits unlawful discrimination on the basis of disability and takes action to prevent such discrimination by providing reasonable accommodations to eligible individuals with disabilities. The university has adopted this policy to provide for prompt and equitable resolution of complaints regarding any action prohibited by Section 504, the ADA, or the ADAAA.

For questions about **support services, documentation guidelines, general disability issues, or pregnancy accommodations**, please visit the Online Accessibility Center (OAC).

As a student, you must complete an interactive intake process, with supporting documentation, in order to be granted accommodations. Once reasonable accommodations are approved by the OAC, you will receive an accommodations letter. You are then responsible for sharing the letter with your instructor. Accommodations are not retroactive.

If you feel you've been subject to discrimination on the basis of disability, by any party, you may file a complaint or grievance. For more information on the ADA/504 Grievance Policy, go to the Disability and Accessibility Services website.

Academic Integrity Policy

Southern New Hampshire University requires all students to adhere to high standards of integrity in their academic work. Activities such as plagiarism and cheating are not condoned by the university. Review the full academic integrity policy.

Copyright Policy

Southern New Hampshire University abides by the provisions of United States Copyright Act (Title 17 of the United States Code). Any person who infringes the copyright law is liable. Review the full copyright policy.

SNHU Withdrawal Policy

Review the full withdrawal policy.

Southern New Hampshire University Policies

More information about SNHU policies can be found on the policy page.