



FLORIDA  
ATLANTIC  
UNIVERSITY

## COURSE CHANGE REQUEST Undergraduate Programs

Department Geosciences  
College Science

UUPC Approval 2/26/24  
 UFS Approval \_\_\_\_\_  
 SCNS Submittal \_\_\_\_\_  
 Confirmed \_\_\_\_\_  
 Banner Posted \_\_\_\_\_  
 Catalog \_\_\_\_\_

**Current Course Prefix and Number** GEO 4167C

**Current Course Title** Spatial Data Analysis

*Syllabus must be attached for ANY changes to current course details. See [Template](#). Please consult and list departments that may be affected by the changes; attach documentation.*

**Change title to:**

**Change prefix**  
 From: GEO To: GIS

**Change course number**  
 From: 4167C To: 4115C

**Change credits\***  
 From: To:

**Change grading**  
 From: To:

**Change WAC/Gordon Rule status\*\***  
 Add  Remove

**Change General Education Requirements\*\*\***  
 Add  Remove

\*See [Definition of a Credit Hour](#).  
 \*\*WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See [WAC Guidelines](#).  
 \*\*\*GE criteria must be indicated in syllabus and approval attached to this form. See [Intellectual Foundations Guidelines](#).

**Change description to:**

**Change prerequisites/minimum grades to:**  
 GIS 4043C - Principles of GIS

**Change corequisites to:**

**Change registration controls to:**

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).

**Effective Term/Year for Changes:** Fall 2024

**Terminate course? Effective Term/Year for Termination:**

**Faculty Contact/Email/Phone** Zhixiao Xie, xie@fau.edu, 7-2852

**Approved by**

Department Chair \_\_\_\_\_

College Curriculum Chair \_\_\_\_\_

College Dean \_\_\_\_\_

UUPC Chair Korey Sorge

Undergraduate Studies Dean Dan Meeroff

UFS President \_\_\_\_\_

Provost \_\_\_\_\_

**Date**

1/31/24

2/15/24

2/16/24

2/26/24

2/26/24

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

## **SPATIAL DATA ANALYSIS**

---

Course #: GIS 4115C  
Credit Hours: 3  
Meeting Day/Time: Weekly Lectures (Viewed Online)  
Meeting Location: **Fully Online Course**

Instructor: Dr. Zhixiao Xie  
Email: [xie@fau.edu](mailto:xie@fau.edu)  
Phone: (561)297-2852  
Office: SE 456A  
Office Hours: W, R 12-3pm and by appointment

Teaching Assistant: Alanna Shapiro  
Email: [alannashapir2021@fau.edu](mailto:alannashapir2021@fau.edu)  
Office: SE 482  
Office Hours: M 5pm-8pm, R 10am-1pm and by appointment

**This following is a tentative outline only, and as such is subject to change**

---

### **Course Description**

This course introduces a variety of spatial quantitative methods commonly used in the GISciences.

---

### **Course Objectives**

The goal of this course is to provide an overview of and an introduction to a range of statistical techniques used in the analysis of geo-spatial data. The emphasis is on gaining insight into the overall framework for analysis and developing an understanding of the various concepts, with in-depth technical treatment of some statistical techniques. The methods are mainly discussed within the context of GIS technology. Students are required to complete a number of lab exercises and projects.

After completing the class, the students are expected to:

1. Understand the basic concepts and principles of geographic information analysis;

2. Know how to implement a variety of spatial quantitative methods within GIS context (e.g. ArcGIS);
3. The class is one required class towards the Advanced GIS certificate

---

## Prerequisites

GIS 4043C - Principles of GIS

---

## Textbooks and Materials

### Required:

O'Sullivan, David and Unwin, David J., 2010, ***Geographic Information Analysis***. 2<sup>nd</sup> Edition. New York: John Wiley & Sons, pp405

**NOTE:** there are two options for you to gain access to the textbook:

- (1) **Free E-Book** through the following link, thanks to the support from FAU library:

<https://ebookcentral.proquest.com/lib/fau/detail.action?docID=4945124>

- (2) Buy a paper copy from bookstore

### Optional Readings:

1. Bailey, Trevor and Anthony Gatrell. 1996. *Interactive Spatial Data Analysis*. Prentice Hall.
2. Haining, Robert. 2003. *Spatial Data Analysis: Theory and practice*. Cambridge University Press.
3. Rogerson, Peter. 2001. *Statistical Methods for Geography*. SAGE Publications.
4. Goodchild, Michael. 2004. *Spatially Integrated Social Science*. Oxford University Press.
5. Fotheringham, Stewart, Chris Brunson, and Martin Charlton. *Geographically Weighted Regression: The analysis of spatially varying relationships*. John Wiley & Sons, Inc.
6. Fotheringham, Stewart and Michael Wegener. 2000. *Spatial Models and GIS: New potential and new models*. Taylor & Francis.

7. Miller, Harvey J. and Jiawei Han. 2001. *Geographic Data Mining and Knowledge Discovery*. Taylor & Francis.
8. Openshaw, Stan and Robert. 2000. *GeoComputation*. Taylor & Francis.

---

## Communications

**Canvas:** This class will be taught in Canvas. Class materials, including announcements, lectures, handouts, assignments, quizzes and exams, are all delivered through Canvas.

### Announcements

All students must regularly (at least three times weekly) access their electronic mail accounts, as well as Canvas for announcements.

### Course-related Questions

Post course-related questions to the discussion board, so that other participants with the same question benefit from the responses. Also, make sure you review this forum prior to posting a question. If you have questions of a personal nature, you should email the instructor. Except for weekends and holidays, the instructor and TA will typically respond to email within 48 hours.

---

## Off-Campus Access

To access software off-campus, you need to use the Geosciences' Cloud Apps. Cloud Apps provides access to software applications from any device – laptops, desktops, tablets, and smartphones – from any location at any time utilizing Citrix technology.

To start using our Cloud Apps, you simply need to download and install Citrix Workspace (**one time only installation**) and then login using your FAU NetID and password. Detailed instructions on the process can be found in the first lab in Canvas.

If you have trouble to access, send email to [geohelpdesk@fau.edu](mailto:geohelpdesk@fau.edu)

---

## Course Components and Grading

## **Course Components**

***Orientation Quiz:*** Each student needs to go through an Orientation quiz so that you are prepared for the class.

***Presentation:*** Each learning unit will be delivered in a presentation. Lecture materials mostly come from the required text.

***Lab Exercises/Class Projects:*** The labs/projects will provide students with opportunities to practice specific methods in GIS or other statistical packages. .

## **Grading Policy**

ITEMS	Grade Weight (%)
Lab Exercises	60
Projects	40
TOTAL	100

**NO late assignments or exam will be accepted**, unless arranged in advance *and* with good reason.

## **Grade Scale**

94 - 100 A	70 - 74 C+
90 - 93 A-	65 - 69 C
85 - 89 B+	60 - 64 C-
80 - 84 B	51 - 59 D
75 - 79 B-	0 - 50 F

## Tentative Course Outline (Subject to revision as conditions warrant).

Unit	Dates	Topics & Assignments	Reading (Req. textbook)	DUE
1	01.08 - 01.16	Course Overview and Orientation Orientation quiz Lec 1-Introduction Lab1-Attributes & Random points	Chap. 1 & 3	Orientation quiz
2	01.17 - 01.23	Lec 2-Nature of spatial data Lab2-Nature of data	Chap. 2	Lab2
3	01.24 - 01.30	Lec 3-Point pattern analysis I Lab3-PPA1	Chap. 4 & 5	Lab3
4	01.31 - 02.06	Lec 4-Point pattern analysis II Lab4-PPA2	Chap. 4 & 5	Lab4
5	02.07 - 02.13	Lec 5-Practical point pattern analysis	Chap. 6	
6	02.14 - 02.20	<b>Project 1 – PPA</b>		Project 1
7	02.21 - 02.27	Lec 6- Area objects and spatial autocorrelation Lab5-AOA	Chap. 7 & 8	Lab5
8	02.28 - 03.12	<b>Project 2 - Spatial Autocorrelation</b>		Project 2
#	03.02 - 03.08	<b>Spring Break</b>		
9	03.13 - 03.19	Lec 7-Describing and analyzing fields Lab6-Fields	Chap. 9	Lab6
10	03.20 - 03.26	Lec-8-The Statistics of Fields Lab7-Kriging	Chap. 10	Lab7
11	03.27 - 04.02	<b>Project 3 - Spatial interpolation</b>		Project 3
12	04.03 - 04.09	Lec-9-Mutivariate Analysis Lab8-MultiVariate		Lab8
13	04.10 - 04.16	Lec-10-Spatial regression Lab9-SpatialRegression	Chap. 12	Lab9
14	04.17 - 04.25	<b>Project 4 - Cluster analysis</b>		<b>Project 4</b>

### Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation,

court-imposed legal obligations or participation in University- approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

---

### **Counseling and Psychological Services (CAPS) Center**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

---

### **Disability Policy**

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).

---

### **Code of Academic Integrity policy**

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal

integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

---

## **Technical Problem Resolution**

In the online environment, there is always a possibility of technical issues (e.g., lost connection, hardware or software failure). Many of these can be resolved relatively quickly, but if you wait to the last minute before due dates, the chances of these glitches affecting your success are greatly increased. Please plan appropriately. If a problem occurs, it is essential you take immediate action to document the issue so your instructor can verify and take appropriate action to resolve the problem.

---