FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL

UGPC APPROVAL _____
UFS APPROVAL _____
SCNS SUBMITTAL _____
CONFIRMED _____
BANNER POSTED _____
CATALOG _____

DEPARTMENT:GEOSCIENCES | **COLLEGE:** Charles E. Schmidt College of Science

RECOMMENDED COURSE IDENTIFICATION:

PREFIX GIS **COURSE NUMBER** 6125 **LAB CODE** (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT RPOLANSK@FAU.EDU)

COMPLETE COURSE TITLE: SPATIAL DATA ANALYSIS

EFFECTIVE DATE
(first term course will be offered)

CREDITS: 3

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

GRADING *(SELECT ONLY ONE GRADING OPTION)*: **REGULAR** X **SATISFACTORY/UNSATISFACTORY** _____

COURSE DESCRIPTION, NO MORE THAN 3 LINES:
This course introduces a range of spatial statistical methods commonly used in the analysis of geo-spatial data in GISciences. The emphasis is on gaining insight into the overall framework for analysis and developing an understanding of various concepts, with in-depth treatment of select techniques. The methods are mainly discussed within the context of GIS technology.

PREREQUISITES *:	**COREQUISITES*:**	**REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:**
GIS 5051C		

* *PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.*

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE:
PHD IN GEOGRAPHY, GEOLOGY, AND OTHER RELATED AREAS

Faculty contact, email and complete phone number:	Departments and/or colleges that might be affected by the new course must be consulted and listed here. Please attach comments from each.
Zhixiao Xie, xie@fau.edu, 561-297-2852	N/A

Approved by:	*Date:*	ATTACHMENT CHECKLIST
Department Chair: _____	_____	•**Syllabus** (see guidelines for requirements: *http://www.fau.edu/graduate/facultyandstaff/programscommittee/index.php)*
College Curriculum Chair: _____	_____	
College Dean: _____	_____	•**Written consent** from all departments affected by new course
UGPC Chair: _____	_____	
Graduate College Dean: _____	_____	

Email this form and syllabus to UGPC@fau.edu **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

GIS 6125-SPATIAL DATA ANALYSIS

(3 Credit Hours)

Instructor:	Zhixiao Xie
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Office Hours:	TBA
TA:	TBA
Email:	
Office:	
Office Hours:	

Course Description and Objectives

This course introduces a variety of spatial quantitative methods commonly used in the GISciences. 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 concepts and principles of geographic information analysis;
2. Know how to implement a variety of spatial quantitative methods within GIS context (e.g. ArcGIS);

Prerequisites: GIS I (GIS 5051C) or equivalent

Required Textbook:

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

Supplemental 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 Brunsdon, 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.

Class Format and Policies:

The class will be divided into two components: lectures and hand-on labs/projects. Lectures will focus on the conceptual basis of spatial quantitative methods. The labs/projects will provide students with opportunities to practice specific methods in GIS or other statistical packages. There are three types of labs/projects: lab exercises, lab projects, and term projects. The lab exercises will have detailed instructions to help digest the lecture materials and get familiar with the analytic methods and environment. The lab project will assign a set of tasks and supply necessary data for students to practice problem solving without instructions from instructors. The term project will require a student to independently choose a topic, design methods, gather data, carry out the analysis and report the findings through presentation and term report.

Grading:

The evaluation of your performance in this course will be derived from: (i) the completion of lab exercise, (ii) assigned lab projects, (iii) a term project.

Grading schedule:

Item	Percentage (%)
Lab exercises	20
Lab projects	50
Term Project	30

Attendance:
Class attendance is required so that students will keep up with the pace. Each absence will lead to a 2% deduction for the class grade.

Makeup:
Makeup is generally NOT allowed.

Tentative Course Outline: subject to revision as conditions warrant.
(The lab/project assignments are usually due one week after they are assigned)

Week	Topics
1	Introduction

	Lab
2	Nature of Spatial Data Lab
3	Point pattern analysis I Lab
4	Point pattern analysis II Lab
5	Practical point pattern analysis Lab project #1
6	Area objects and spatial autocorrelation lab
7	Lab project #2
8	Describing and analyzing fields lab
9	The statistics of fields Labs
10	Lab project #3
11	Multivariate methods Lab
12	Lab project #4
13	New methods in spatial data analysis lab
14	Term project
15	Term project
16	Presentation/report

Web Resources:

o Center for Spatially Integrated Social Science (CSISS) main site, especially its learning materials, syllabi and search engines: http://www.csiss.org/

o CSISS spatial tools clearinghouse site, with a specialized tools search engine, links to portals and selected links to specific software:
http://www.csiss.org/clearinghouse/index.php3

o Geostatistical Software Library at Stanford University: http://www.gslib.com/

o SpaceStat home site, with tutorials, downloadable data sets and other utilities:
http://www.terraseer.com/products/spacestat.html

o TerraSeer home site, with tutorials on cluster analysis and boundary analysis:
http://www.terraseer.com/

o GeoDa home site, with free software, tutorials, downloadable data sets and other utilities: https://www.geoda.uiuc.edu/

o The CrimeStat Spatial Statistics Program home site, with free software, sample data, tutorials, etc: http://www.icpsr.umich.edu/NACJD/crimestat.html/

o R Spatial Projects home site, an international open-source project (R) that provides an environment for statistics, including spatial data analysis:
http://sal.uiuc.edu/csiss/Rgeo/

o SPATSTAT, a R library for spatial statistics: http://www.maths.uwa.edu.au/~adrian/spatstat/

- o STARS - Space Time Analysis of Regional Systems; an open-source project to develop space-time data analysis in Python: https://sourceforge.net/projects/stars-py/
- o ESRI home page, with links to resources for digital maps, data sets, utilities, courses, scripts, etc.: http://www.esri.com/
- o ESRI ArcScripts Online: http://arcscripts.esri.com/
- o Michael Goodchild (UC Santa Barbara) on Spatial Analysis and GIS: 2001 ESRI User's conference pre-conference seminar course outline and materials:

http://www.csiss.org/learning_resources/content/good_sa/

Off-Campus Access

To access software off-campus, you need to use the new Citrix server.

For accessing the system, provide the link
http://www.geosciences.fau.edu/computing/citrix_tutorial_xenapp.html
to watch the tutorial for connecting to the applications, and provide a link to the Citrix server, http://geoapps.fau.edu, to connect to after watching the tutorial.

If you have trouble to access, send email to geohelpdesk@fau.edu

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Disability Policy:
In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) - in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter. SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

Honor Code:
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 at
http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf