**FLORIDA ATLANTIC UNIVERSITY**

Graduate Programs—NEW COURSE PROPOSAL

**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 RPOLANSKI@FAU.EDU)*

**COMPLETE COURSE TITLE:** SPATIAL DATA ANALYSIS


**CREDITS:** 3

**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:**
GIS 5051C

**MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE:**  
PhD in Geography, Geology, and other related areas

**Faculty contact, email and complete phone number:**  
Zhixiao Xie, xie@fau.edu, 561-297-2852

**ATTACHMENT CHECKLIST**

- Syllabus (see guidelines for requirements: http://www.fau.edu/graduate/facultyandstaff/programscommittee/index.php)
- Written consent from all departments affected by new course

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.

*FAUnewcourseUG—Revised August 2011*
GIS 6125-SPATIAL DATA ANALYSIS
(3 Credit Hours)

Instructor: Zhixiao Xie
Email: xie@fau.edu
Phone: (561)297-2852
Office: SE412D
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:

Supplemental Readings:
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:

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab exercises</td>
<td>20</td>
</tr>
<tr>
<td>Lab projects</td>
<td>50</td>
</tr>
<tr>
<td>Term Project</td>
<td>30</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
</tr>
<tr>
<td>Lab</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>Nature of Spatial Data</td>
</tr>
<tr>
<td>3</td>
<td>Point pattern analysis I</td>
</tr>
<tr>
<td>4</td>
<td>Point pattern analysis II</td>
</tr>
<tr>
<td>5</td>
<td>Practical point pattern analysis</td>
</tr>
<tr>
<td>6</td>
<td>Area objects and spatial autocorrelation</td>
</tr>
<tr>
<td>7</td>
<td>Lab project #2</td>
</tr>
<tr>
<td>8</td>
<td>Describing and analyzing fields</td>
</tr>
<tr>
<td>9</td>
<td>The statistics of fields</td>
</tr>
<tr>
<td>10</td>
<td>Lab project #3</td>
</tr>
<tr>
<td>11</td>
<td>Multivariate methods</td>
</tr>
<tr>
<td>12</td>
<td>Lab project #4</td>
</tr>
<tr>
<td>13</td>
<td>New methods in spatial data analysis</td>
</tr>
<tr>
<td>14</td>
<td>Term project</td>
</tr>
<tr>
<td>15</td>
<td>Term project</td>
</tr>
<tr>
<td>16</td>
<td>Presentation/report</td>
</tr>
</tbody>
</table>

**Web Resources:**

- Center for Spatially Integrated Social Science (CSISS) main site, especially its learning materials, syllabi and search engines: http://www.csiss.org/
- 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
- Geostatistical Software Library at Stanford University: http://www.gslib.com/
- SpaceStat home site, with tutorials, downloadable data sets and other utilities: http://www.terraseer.com/products/spacestat.html
- TerraSeer home site, with tutorials on cluster analysis and boundary analysis: http://www.terraseer.com/
- GeoDa home site, with free software, tutorials, downloadable data sets and other utilities: https://www.geoda.uiuc.edu/
- The CrimeStat Spatial Statistics Program home site, with free software, sample data, tutorials, etc: http://www.icpsr.umich.edu/NACJD/crimestat.html/
- 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 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://arccscripts.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

---

**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