Course Syllabus
GSS350 – Applied Geospatial Data Analysis

Prerequisites: AMS102 or equivalent and GSS313 or equivalent

Instructor: TBD
Office Hours: By appointment
Office Location: TBD
Email:

Course Description:
This course is intended as an introduction to geospatial statistical analysis, and aims to provide students with the background necessary to investigate geographically represented data. There are a large number of problems involving spatial data, but focus will be placed on methods that are relevant in the fields of public health, environmental/earth science and social science. The specific focus is on spatial data analysis, such as the analysis of autocorrelation and principles of geostatistics. An important aspect of the course is to gain hands-on experience in applying these techniques with GIS and spatial analytical software. The main goal of the class is for students to become familiar with the essential methodological and practical issues that are involved in sophisticated spatial analyses using GIS.

Learning Outcomes:
Upon completion of this course, students should be able to:

- Distinguish different types of spatial data (geostatistical, areal, point process)
- Understand how spatial autocorrelation plays a role in statistical modeling.
- Use existing methods to investigate spatial autocorrelation in example datasets provided as exercises.
- Account for the effects of spatial autocorrelation in georeferenced data.
- Determine which spatial methods to use to in their own research/project and implement them using statistical software and GIS.
- Read and discuss new methods in the spatial statistics literature based on an understanding of the basic spatial statistics approaches, principles and main assumptions.

Required Materials:

- Konstantin Krivoruchko Spatial Statistical Data Analysis for GIS Users (2011) ESRI Press
Not Required, but useful references are:


The course will use R (a statistical computing environment and language), Open GeoDa, and ESRI ArcGIS Geostatistical Analyst. R and Open GeoDa software are free and available for all operating systems via www.r-project.org (R) and geodacenter.asu.edu (Open GeoDa).

For the computing component of this course, students are encouraged to use the following as references:


**Assignments:** There will be approximately 5 assignments given throughout the semester with more frequency at the beginning. Students may discuss the problems with one another, however, individual solutions must be submitted and copying will not be tolerated. Late assignments will be penalized by 20% for each day past the due date.

**Exam:** The course will have one midterm exam that will be given approximately half way through the course.

**Project:** The final project can be done individually or in a group of up to 3 people. A proposal must be submitted one month before the project is due. The project must consist of statistical analysis of a real dataset and a written report in the form of a scientific paper that summarizes the project. The report must have an abstract, introduction, methods, results and discussion. The project topic is up to the student but should draw from his or her own research or area of interest. It may also involve data from the census, surveys, simulations or a datasets from published papers.
**Tentative Schedule:**

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**Grading:**

Participation and Attendance 10%
Class exercises 40%
Midterm 20%
Final Project (proposal, presentation, paper) 30%

**Basis for grading:** 100-95 (A); 94-91 (A-); 90 – 88 (B+); 87 – 84 (B); 83-81 (B-); 80-78 (C+); 77-74 (C); 73-71(C-); 70-68 (D+); 67-60 (D).
Cell Phone and Electronic Devices: Use of cell phones, blackberries, laptop computers, iPods, MP3 players, and other audio and telecommunications devices is strictly prohibited during class. The only exceptions are through permission granted by the instructor for special purposes. Clickers are excluded from this prohibition, if required for the class. During regular class sessions, cell phones must be either in ‘vibrate mode’ or turned off. Calls cannot be answered. Text messaging is not allowed during class. Cell phones must be turned off and enclosed in a case, book bag, briefcase, or the like during tests and exams. YOU are responsible for ensuring this policy is followed. Students MAY NOT have cell phones, electronic dictionaries, calculators, pagers or other “information rich” devices (anything that can receive and/or store many pages of text) in their possession during tests and exams.

Academic Dishonesty Policy: Academic dishonesty is a serious offense and a breach of academic integrity that may result in failure of the course or failure for the individual paper or assignment. The “Code of Student Conduct” states that all forms of academic dishonesty, including the following are prohibited (see student handbook):
- Plagiarism – the intentional use of ideas or words of another as one’s own paper or other academic assignments. If you are unsure of what constitutes Plagiarism visit this document http://www.wpacouncil.org/positions/WPAplagiarism.pdf or ask the instructor.
- Cheating during examinations, whether by copying from a fellow student or by using information in the form of unauthorized aids brought to the examination.
- The submission of work for any assignment that has been prepared by another student.

Academic Integrity Statement: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at: http://naples.cc.sunysb.edu/CAS/ajc.nsf.

Classroom Policy: Students are expected to follow the Stony Brook Code of Conduct while in the classroom. If you are not familiar with the Code you can find it at: http://studentaffairs.stonybrook.edu/sites/handbook/Code_1-22-03.pdf Behavior that is disruptive to the function of the class, other students, or the instructor will not be tolerated. Poor class behavior or violations to the Code of Conduct will lead to removal from the class, possible withdrawal, or suspension. Food is not permitted in class. Beverages are OK, but please bring a container the can be closed to reduce spills. If a spill occurs please clean it up immediately.

Instructional Responsibilities: The University's statement of Minimal Instructional Responsibilities and Minimal Undergraduate Student Responsibilities are protocols with which you may already be familiar. They were established by the University Senate in 1996. If you have not already done so, please review them carefully. Both statements may be found beginning on page 81 of the Academic Policies and Regulations section of the on-line Undergraduate Bulletin: http://www.stonybrook.edu/ugrdbulletin/current/index.shtml
**ADA Statement:** If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or [http://studentaffairs.stonybrook.edu/dss/](http://studentaffairs.stonybrook.edu/dss/). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: [http://www.sunysb.edu/ehs/fire/disabilities.shtml](http://www.sunysb.edu/ehs/fire/disabilities.shtml)

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**Electronic Communication Statement**
Email and especially email sent via Blackboard ([http://blackboard.stonybrook.edu](http://blackboard.stonybrook.edu)) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education ([http://www.stonybrook.edu/mycloud](http://www.stonybrook.edu/mycloud)), but you may verify your official Electronic Post Office (EPO) address at [http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo](http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo).

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at [http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail](http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail).

If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu.