

GRG310C: Spatial Data and Analysis

Dept. of Geography and the Environment, The University of Texas at Austin

Spring 2014

GENERAL INFORMATION

Class Meeting Times

Tuesday and Thursday 9:30 AM – 11:00 AM

Location: PAR 306

Instructor: Niti B. Mishra

Office: CLA 3.400 (#16); Email: niti@mail.utexas.edu

Office Hours: Tuesday and Thursday 11:30 AM – 12:30PM; or by appointment

COURSE DESCRIPTION

This is an entry level course that will prepare the student for higher level courses in geographic methods and techniques. The course content consists of a series of modules designed to cover topics common to courses in Cartography, Geographic Information Science, Field Techniques, and Remote Sensing of the Environment.

We will examine quantitative methods of sampling, representing, classifying, and analyzing geographic phenomena. We will examine conceptions of temporal and spatial scale, location, distance and direction, and examine a broad range of geographic research methods. Specific topics will include earth shape, gravitational and magnetic fields, map projections, coordinate systems, measurements and errors, spatial statistics, spatial analysis and principles of remote sensing and image analysis.

Classes will consist of lectures and discussions of the readings. Students will complete six exercises and three examination.

COURSE GOALS

1. To understand some of the basic principles and concepts common in the field of GIS, Cartography, Field Techniques and Remote Sensing of Environment.
2. To develop basic quantitative skills required for interpretation and analysis of geospatial data.
3. To appreciate some critical issues associated with spatial analysis, for example, data quality and availability.

EXPECTED LEARNING OUTCOMES

1. Students will learn spatial reasoning and thinking.
2. Understand concepts of spatial data and issues and challenges associated with spatial analysis.
3. Visualize and identify spatial problems.
4. Students will learn selected spatial analytical techniques.

EXPECTATIONS FROM THE STUDENT (tips for success in this class)

1. Students must do their reading assignment for the upcoming lecture before the class. This will help them to understand the materials taught in the class, and they will be able to clarify issues within class itself while the topic is being taught.
2. Students will push themselves to explore more on topics taught in class.
3. Listen to lectures carefully and take notes over written materials.
4. Go through your lectures and tally your notes after class every day.
5. Attend lectures regularly. Submit completed exercises within due dates.
6. Class participation. Ask questions and discuss topics within the lecture session.

7. No use of phone in class. Should your phone ring during class, you will be asked to stand and sing a song of your choice to your colleagues.

REQUIRED READING MATERIALS

You are responsible for completing all the readings as listed on the course schedule and assigned in class. Readings are due on the date they are listed in the syllabus and will be discussed in class on the day they are due.

Textbook: Peter A. Rogerson, 2010, *Statistical Methods for Geography: A Student's Guide 3rd Edition*

Additional materials will be posted on blackboard. Class lectures will be also posted on blackboard after their correspondent lecture sessions. There will also be information that is only presented in class and therefore if you miss class you must obtain the notes from someone else in the course.

BLACKBOARD

Information such as syllabus and schedule will be posted on BLACKBOARD. It is students responsibility to check it regularly.

ATTENDANCE

Lecture attendance is expected and is critical to your success. Students are required to sign in the attendance sheet for lecture at the beginning of each lecture. Lecture attendance will contribute 5% towards final grades. Material will be covered in lecture including lecture topics, concepts, readings, internet material, and additional tips and instructions, all of which are not in the book. You should enter the lecture session on time. In case of late entrance to the lecture or lab, you are solely responsible to take care of the missing part of the lecture. Portions missed by you due to your late entrance will not be repeated.

Exercises

The students will complete seven exercises during the semester. The exercises will be posted on blackboard and the students will turn in their answers in the beginning of the class on the due date specified in the class schedule.

Exams: Two exams will be given on the dates listed in the syllabus and are designed to assess your comprehension of presented materials. The two exams will consist of true/false and multiple choice questions, short essays, and analytical problems based on material from class presentations and readings. You are expected to take the exams at the scheduled time. Make-up exams will be given ONLY for exceptional circumstances, such as illness or university-approved event, and proof will be required. In cases where you have a scheduling conflict for a university-approved event, it is YOUR responsibility to notify the instructor at least two weeks before the exam. In the case of emergencies, it is YOUR responsibility to notify the instructor via email that you will be unable to attend, preferably before the exam or within 24 hours after the exam.

GRADES

Grade Distribution

Assignment	Percentage
Six Exercises (5.83% each)	35%
3 Exams (20% each)	60%
Attendance	5%
Total	100%

Grade Scale

Grade	Percentage (%)
A	94 – 100
A-	90 – 93.9
B+	86 – 89.9
B	82 – 85.9
B-	78 – 81.9
C+	74 – 77.9
C	70 - 73.9
C-	66 - 69.9
D+	62 – 65.9
D	58 – 61.9
D-	54 – 57.9
F	below 54

ACADEMIC MISCONDUCT (CHEATING AND PLAGIARISM)

Intellectual integrity is expected in all work. Collaboration and the use of a wide range of references is encouraged, but any plagiarism, use of un-cited materials, or un-credited project assistance will result in a “faculty disposition” of course failure.

See: (http://deanofstudents.utexas.edu/sjs/scholdis_plagiarism.php).

UT Policy on Scholastic Dishonesty:

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information please visit the Student Judicial Services Web site: <http://deanofstudents.utexas.edu/sjs>.

UT Academic Accommodations for Students with Disabilities

Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 471-6259 (voice) or 1-866-329-3986 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations.

(<http://www.utexas.edu/diversity/ddce/ssd/providing.php#SYLLABUS>)

Class Schedule, Topics, and Assignments (subject to change)

Date	Topic	Assignment/reading due on this date
1/14 Tu	Course Overview	-----
1/16 Th	The Scientific Method	Rogerson, Chapter 1
1/21 Tu	Measurement Levels	Rogerson, Chapter 2 (Exercise 1 assigned) Random Numbers
1/23 Th	Descriptive Statistics	Rogerson, Chapter 2
1/28 Tu	Descriptive Statistics	Rogerson, Chapter 2 (Exercise 1 due)
1/30 Th	Descriptive Spatial Statistics	Rogerson, Chapter 2 (Exercise 2 assigned) Book pages
2/4 Tu	Objects versus fields	Reading/PPT posted
2/6 Th	Concept, types and importance of scale	Reading/PPT posted (Exercise 2 due)
2/11 Tu	Sampling Geography (Exam review)	Reading/PPT posted
2/13 Th	Exam 1	-----
2/18 Tu	Measurement, Accuracy and Precision	Reading/PPT posted
2/20 Th	Probability: Discrete functions	Rogerson, Chapter 3 (Exercise 3 assigned) Length in nature
2/25 Tu	Probability: Continuous functions	Rogerson, Chapter 4
2/27 Th	Aggregation and classification	Reading/PPT posted (Exercise 3 due)
3/4 Tu	Shape of the Earth: Where am I?	Reading/PPT posted
3/6 Th	Coordinate systems/Map projections	Reading/PPT posted (Exercise 4 assigned) Google Earth
3/11 Tu	Spring Break	-----

3/13 Th	Spring Break	-----
3/18 Tu	Inferential Statistics	Rogerson, Chapter 5 (Exercise 4 due)
3/20 Th	Inferential Statistics (Exam review)	Rogerson, Chapter 5
3/25 Tu	Exam 2	-----
3/27 Th	Analysis of Variance	Rogerson, Chapter 6
4/1 Tu	Spatial Patterns	Reading/PPT posted (Exercise 5 assigned) Inference: Book pages
4/3 Th	Correlation	Rogerson, Chapter 7
4/8 Tu	Spatial Autocorrelation	Reading/PPT posted (Exercise 5 due)
4/10 Th	(Work on Exercise) AAG	(Exercise 6 assigned) Rank Correlation
4/15 Tu	Regression	Rogerson, Chapter 8
4/17 Th	Remote Sensing Introduction	Reading/PPT posted
4/22 Tu	Remote Sensing Issues	(Exercise 6 due)
4/24 Th	Remote Sensing Issues	Reading/PPT posted
4/29 Tu	Geographic Information Systems Introduction	Reading/PPT posted
5/1 Th	Geographic Information Systems Issues / (Course review)	Reading/PPT posted
5/9 Fri	Final Exam (9 AM-12 PM)	Check with registrar