Spatial Data and Analysis
GRG 310
Spring 2013
Unique # 37450

Class Meeting Times
Tuesday and Thursday 3:30-5:00PM

Classroom
CLA 1.102

Instructor
Peter H. Dana
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Office CLA 3.408

Office Hours
Tuesdays: and Thursdays 2:00-3:00 PM
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 and qualitative 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, surveying and navigation, measurements and errors, spatial statistics, and spatial analysis.

Classes will consist of lectures and discussions of the readings. Students will complete nine exercises, a mid-term examination and a final examination.

Requirements

Students are expected to attend all classes, participate in discussions, and complete all assignments. No late assignments will be accepted without prior notice and all late work will result in a 5% assignment grade reduction for each day late.

Intellectual Integrity

Intellectual integrity is expected in all work. Collaboration and the use of a wide range of references in 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)

Grading

Nine Exercises (5.556% each); 50%
Mid-term Examination; 25%
Final Examination; 25%

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

Date	Topic	Assignment Due On This Date
1/15 Tu	Course Overview	----------
1/17 Th	The Scientific Method	Rogerson, Chapter 1
1/22 Tu	Measurement Levels	Rogerson Chapter 2
1/24 Th	Descriptive Statistics	**Exercise 1: Random Numbers**
1/29 Tu	Space is Special	
1/31 Th	Place is more than Space	**Exercise 2: Measurement Levels**
2/05 Tu	The Importance of Scale	Rogerson, Chapter 3
2/07 Th	Sampling Geography	**Exercise 3: Descriptive Statistics: Book Pages**
2/12 Tu	Probability: Discrete Functions	
2/14 Th	Accuracy and Precision	**Exercise 4: Length in Nature**
2/19 Tu	Objects and Fields	Rogerson, Chapter 4
2/21 Th	Probability: Continuous Functions	**Exercise 5: Place Description; Quality from Quantity**
2/26 Tu	Aggregation and Classification	

2/28 Th	The Shape of the Earth	**Exercise 6: Earthquake Occurrence**
3/05 Tu	Time	Rogerson, Chapter 5
3/07 Th	**Mid Term Examination**	------
3/12-14	***Spring Break***	----
3/19 Tu	Inferential Statistics	Rogerson, Chapter 6
3/21 Th	Measurements	
3/26 Tu	Analysis of Variance	
3/28 Th	Distance and Direction on the Earth	**Exercise 7: Inference: Book Pages**
4/02 Tu	Map Projections	
4/04 Th	Map Distortions	Rogerson, Chapter 10
4/09 Tu	Geographic Coordinate Systems	
4/11 Th	Spatial Patterns	**Exercise 8: Time and Space Map**
4/16 Tu	Correlation	Rogerson, Chapter 7
4/18 Th	Spatial Autocorrelation	Rogerson, Chapter 8
4/23 Tu	Regression Analysis	Rogerson, Chapter 9
4/25 Th	Geographic Information Systems Issues	**Exercise 9: Rank Correlation**
4/30 Tu	Remote Sensing Issues	
5/02 Th	Course Review	**Exercise 10: Student Selected Project**
5/11 Sa	**Final Exam 9:00 AM-12:00 PM**	**Check with Registrar!**

Required Text:
Rogerson, Peter A. 2010. *Statistical Methods for Geography*. 3rd ed. London: Sage.

Exercises (Details posted on Blackboard/Assignments):

Exercise 1: Random Numbers

For this exercise you will need ten coins. Each student is going to produce twenty random numbers and a sum and distribution graph of these numbers

Exercise 2: Measurement Levels

Get a copy of the Daily Texan. Find at least one example of Nominal, Ordinal, Interval, Ratio, and Cyclic attributes. List the examples and explain why they fall into their category.

Exercise 3: Descriptive Statistics: Book Pages

Select thirty books that you have access to. Compute descriptive statistics for the number of pages in this set of thirty books. Include *Mean*, *Standard Deviation*, *Range*, and *Median*. Later (Ex 8) you will compare the statistics for your books with those of the class as a whole.

Exercise 4: Length in Nature

Pick a major river or a state with a coastline. Find as many references as you can that give a value for river length or state coastline length. List the sources and the lengths.

Exercise 5: Qualitative Place Description from Quantitative Information

Use census values from the American Factfinder Web site as the basis for a qualitative description of place.

Exercise 6: Earthquake Occurrence

You will pick a part of the world and plot the probability of earthquake magnitudes over time.

Exercise 7: Inference: Book Pages

Using the class ensemble of statistics from Exercise 3, you will assess how "different" your books are from the set of books described by the whole class.

Exercise 8: Time and Space

Map a day in Austin using a simple time-space mapping scheme.

Exercise 9: Rank Correlation

Make a list of the rank occurrence of letters and spaces in text you have written. Compare your letter rank with standard lists.