

# Spatial Analysis

## Geography 315, Fall 2008

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**Class Time:** Tuesday & Thursday 9:30 am- 10:45am  
**Location:** Butte 501  
**Office hours** Tuesday/Thursday, 11:00-noon, Butte 504 or by appt.  
**Instructor:** Chris Lewis **Contact:** Email Address: [cclewis@csuchico.edu](mailto:cclewis@csuchico.edu) Phone: 898-4774

### Course Description

This course is designed to acquaint you with several of the major statistical techniques used in geography. This will include general descriptive and basic predictive statistics as applied to physical and cultural geography applications. The emphasis will be on a hands-on, interactive approach. Coverage will be at an introductory to intermediate level and the goal is to demystify some of what you come across in the geographical literature. Students will complete tutorials and assignments using Excel, SPSS and ArcGIS.

### Prerequisites

Students should have a strong understanding of the MS WINDOWS system, MS Word and MS Excel, network navigation. Required Geography 219 or Math 105. While this class will include some review of basic statistics, if you do not have these prerequisites you will need to put more time in outside of class. This is a demanding class between learning the statistical concepts, the software navigation and procedures and completion of assignments.

### Course Objectives

After the course you should:

- be armed with enough knowledge and experience to be less intimidated by the quantitative techniques used in Geographical Literature.
- understand the special issues and problems associated with geographic data.
- be able to determine the appropriateness of various statistical tests and procedures for analyzing different types of geographic data.
- be able to use some of these techniques in your own work.

### Expectations

It is expected that you will attend every class and keep up with all quizzes, reading and activities. This class consists of participatory class attendance. You are responsible for all material covered in class. If you miss a class, even for a legitimate reason, you are still responsible for the material covered in that class and should get notes from a fellow student. Many students find learning statistics challenging. It is much less stressful and easier to learn if you work hard to keep up with the class and don't fall behind. Expect to spend at least 6 hours outside class each week reading the chapters and completing any homework exercises and quizzes. In addition, you may require extra practice with the software on your own time.

### Required Text

J. Chapman McGrew, Jr., Charles B. Monroe, (2000) *An Introduction to Statistical Problem Solving in Geography 2<sup>nd</sup> edition*, Boston: McGraw Hill. ISBN: 0-697-22971-8.

### Recommended Texts

Salkind, N.J. (2004) *Statistics for People who (Think They) Hate Statistics*. 2<sup>nd</sup> edition, Sage Publications, Thousand Oaks, CA. A friendly approach to basic non-spatial statistics. Some editions come with a student version of SPSS.

Mitchell, A. (2005) *The ESRI Guide to GIS Analysis, Volume 2*, ESRI Press, Redlands, CA. This is a nice graphic approach to spatial statistical techniques. I will assign the first two chapters. Some parts of lecture will come from this book. A copy will be on reserve all semester.

## Readings

In addition to the texts, there will be several readings assigned for discussion in class and as part of exercises. It is expected that all students will have read, or at least skimmed the assigned materials (text and supplementary readings) prior to class. Your grade will be partly assigned based on your demonstration of a reading knowledge of those materials during class discussions. You must bring the text and other assigned readings to class, unless told otherwise by the instructor. I will expect you to be prepared to have an understanding of and to deliver a summary statement of the issues. Some exercises will have an in-class component, on the due date, in the form of a presentation of the results of your readings. It is recommended that you take notes as you read and bring them to class for discussion.

## Online Elementary Statistics Materials

I will augment the text by assigning or recommending materials from the Sofia online course materials at: <http://sofia.fhda.edu/gallery/statistics/index.html>, primarily from the Lessons and Lesson Videos (Resources section). The Lesson Videos require iTunes installed on your computer. Check with the Lab Manager, Cathie Benjamin, if you wish to listen to these in the lab. You will need to bring your own headphones.

## Exercises

Exercises are handed out in class and will have due dates on them. They are due at the beginning of class on the due date. Late assignments will not be accepted unless an extension, due to extenuating circumstances, has been granted prior to the due date and the work is handed in before the beginning of the next class period. Late work will not be accepted. While students are encouraged to work together on the software, all assignments and exercises turned in for a grade should be your individual work, i.e. each student should complete an independent analysis and write up of the results, unless specifically stated otherwise.

## Lab Objectives:

To provide hands on statistical analysis of geographical data, i.e. learn by doing and to introduce the use of statistical software (SPSS) in geographical analysis. To make the student feel comfortable about using statistical software, data preparation and management, and interpretation. You will primarily use Excel, SPSS and ArcGIS in this class. It is expected that you already are able to work in Excel. Introductory activities will be used to introduce basic functionality for this class in SPSS and ArcGIS. You will need to put in considerable time outside of class to practice and complete activities introduced in class.

## Lab and Lab Materials

As a student in this class you will receive a one year time-out student version of ArcGIS 9.x. For the amount of time that we will be using SPSS, using the lab should be sufficient. Butte 501 and the social science labs downstairs in Butte 207, 209 & 211 have open times during the week and on weekends. Please check out these schedules ASAP, so that you are able to plan your study time accordingly. Note: The Salkind Text includes a student version of SPSS v.15 for your personal computer.

**Geography Lab Computers:** While we will be meeting in the Geography Lab for class, we will not always be using the computers. I expect all students to abide by the following rules:

- 1) **NO** food or beverages are allowed on the tables, desks, or floor anywhere in the lab.
- 2) During lecture/ discussion no monitors will be turned on at anytime, unless otherwise instructed.
- 3) All cell phones and other electronic devices must be turned off.

## Exams and Quizzes

A quiz will be given online approximately every two weeks. These are meant to help you learn the material and check your progress and understanding. Therefore you will be able to repeat the quiz up to three times (The questions may change.) during the quiz time period (usually about 3-4 days). The best score will be recorded. No make-up quizzes.

There will be 1 midterm exam and a Final exam. Exams will cover the lecture material, assigned readings and exercises. A series of problems to be solved by hand with interpretation will be required.

In fairness to all students in the class, only events such as serious illness or a death in the family, are an acceptable excuse for missing an exam. If a student has advance knowledge of a conflict in schedule due to other compelling obligation, a request must be made ahead of the exam day and is subject to denial. The Instructor will require verification (doctor's excuse). You must contact me BEFORE the exam. A makeup exam will not be the same exam as given in class.

## Paper Discussion

I will assign three journal articles and sections of chapters of the McGrew, or other texts to be read for class discussions led by your peers. A group of three of your classmates will lead each discussion. You will be divided into 7 groups of three minimum, 4 maximum. Each student will be required to read all of the articles, or chapter sections, but only the group that is assigned to that reading will write a one page summary. Each group will lead an in-class discussion for 12 minutes. The specifics and grading criteria will be handed out by Tuesday of the 5<sup>th</sup> week of the semester.

## E-mail/online course materials

Online quizzes and other course materials will be on WebCT VISTA. Students will be expected to check online regularly for updates to assignments and access to other course materials. In addition, discussions and a FAQ (frequently asked questions) will be set up for specific assignments. Several class sessions will be completely online TBA. Butte 501 will be a class open lab work period during those times. See the schedule.

## Academic Honesty

If there is evidence that you have been involved in any form of academic dishonesty (ie. Plagerism or collusion), you may receive an "F" grade for the assignment, exam or for the entire course, and a report will be provided to Student Judicial Affairs for further action. Please read the university's guidelines on academic honesty.

## Disability

If you have a documented disability that may require reasonable accommodations, please contact Support Services (DSS) for coordination of your academic accommodations. The DSS phone number is 898-5959 V/TTY or FAX 898-4411. Visit the DSS website at <<http://www.csuchico.edu/dss/>>.

## Grades

Exercises (5)	35%
Paper Discussion	5%
Quizzes (7)	10%
Midterm	25%
Final Exam	25%

Incomplete given for serious and compelling reasons only, at the discretion of the instructor.

*"Anyone who has never made a mistake has never tried anything new."*  
Albert Einstein