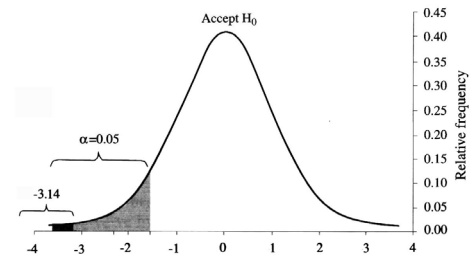


Syllabus
Geography 441
Quantitative Methods in Geography

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*Optional Text: **Statistical Methods for Geography**, by Peter Rogerson (latest edition)*

Course Objectives

This course is designed to introduce the student to the use of statistical techniques for geographical analysis. In particular, the student will learn how standard statistical techniques can be applied in a spatial manner. Additionally, students will master several spatial analytical/statistical tools that have been developed specifically for geographical data. Upon completion of this course the student will

1. Use advanced statistical analysis methods to examine geographic data.
2. Understand problems arising from the use of spatial data.
3. Become familiar with the problems of spatial techniques and methods use to overcome these problems.
4. Perform scientifically rigorous analysis.

Graduate Student Requirements

Believe it or not, this is a 400-level course. Therefore, graduate students have an additional timed online assignment, available via D2L. This is made available 2 weeks before finals.

Grading

Grading for this course will be weighted heavily on the exercises and tests. In class and out of class exercises, and readings will also be factors in determining your grade. If you **MUST** miss class please notify me ahead of time if possible. ***If you miss more than 3 classes you will likely not be able to pass this course.***

Grading Scheme

| | Points |
|-------------------|------------------------------------|
| Midterm | 200 (100 pts per each of 2 tests) |
| Final | 200 (100 pts per each of 2 tests) |
| Exercises | 170 |
| SPSS Exercises | 80 |
| Online Assignment | 50 (grads only) |
| Online Assessment | Not graded but required (everyone) |
| TOTAL | 650-700 |

The online assessment is used to gauge how well students retain material and will be used as part of our overall departmental assessment effort. It is timed (like a quiz), but it is not graded. However, completing this assessment quiz IS required for completion of the course. Please do not look up material when taking this assessment. I am interested in determining which concepts students can easily recall and which concepts they struggle with. The results of this assessment will help me to focus effort where it is most needed.

Notes

It is impossible to take good notes for this class. There is too much information to write down while you are trying to listen AND follow along. To address this problem I have posted all of the lecture notes on my web page (<http://webspace.ship.edu/pgmarr/Geo441/Geo441.htm>). You will need to print each week's lecture notes in advance and bring them to class. Use the class time to annotate these notes.

Exercises

Out of class exercises are due at the beginning of the next class period unless otherwise noted. Late exercises receive no grade unless you have seen me before hand and I have agreed to give you an extension (a rare event... $p < 0.001$). Please make sure that they are legible and that all work is shown and that you follow the exercise format. You WILL be responsible for the exercise material on the tests.

You MUST bring your calculator to EVERY class. If you forget your calculator you will probably have to run home to get it.

Tests

In class tests are of the combination type, meaning that there will be a variety of question types. Expect multiple choice, fill in the blanks, definitions, calculations, etc... The test will be written to be completed in the available class time. Most of the time will be devoted to the calculations (working on them and checking them for errors). Do not panic. I like to give lots of time for tests, but it doesn't mean that you will need it.

Take home tests will be handed out the week BEFORE the in-class test and are due on the test day at the beginning of class. Late take home tests will not be accepted. You may work in groups if you like... groups will make the take home tests a lot easier. Everyone must hand in an individual test and they can not simply be copies of a group "master" test. The best way to work a group is to check your individual answers amongst the members of the group. The material on the take home will be repeated on the in-class test and there will be time pressures as well, so the take home is a means of studying and preparing for the in-class test.

Readings

Please have all of the reading done BEFORE class. We will be discussing the readings during class and your input is expected. We will also use the first part of class to address any question that you have on the readings, so reading the material in advance is crucial.

Classroom Etiquette and Participation

Turn off all cell phones when you enter class. If I see you texting someone or looking at your phone, I will ask you to leave class. If you try to sleep in class I will bean you on the head with a piece of chalk. I will call on people during class to answer questions. Try your best and do not be afraid to be wrong... you would not be in this class is you already knew all of the answers.

Special Note: In order to pass this course you must complete all tests, complete at least 80 percent of the exercises, and miss no more than 3 classes.

Some Final Thoughts:

This course requires a significant amount of work. At some point during the semester your brain may spontaneously combust... this is normal. However, as a reward for brain carbonization you will acquire a skill that few people have. A thorough understanding of statistical techniques is key to good science and will help you when conducting research both as a student and an employee. If something is not clear, please ask me to explain. If you find mistakes or omissions in any of the course material (they do exist), please let me know so I can fix them. Contrary to popular belief, statistics is not boring... courses are only boring if you go into them thinking they are boring. And remember: ***there is no crying in Quantitative Methods.***

Course Outline

| | Date | Day | Topic | Chapter Sections | Exercises and SPSS [†] | Mini Labs [‡] |
|-----|------|-----|--|------------------|---------------------------------|------------------------|
| Jan | 22 | W | Intro, Answer Format, | 1 | | |
| Jan | 27 | M | <i>SPSS: Introduction and Graphing</i> | 2 | 1 | |
| Jan | 29 | W | Descriptive Statistics | 2 | SPSS 1 | |
| Feb | 3 | M | Continuous Probabilities | 3, 4 | SPSS 2 | |
| Feb | 5 | W | Hypothesis Testing | | 2, 3 | |
| Feb | 10 | M | Normality Testing | 5 | | Mini 1 |
| Feb | 12 | W | 1 and 2 Sample T-Tests | 5 | 4, SPSS 3 | Mini 2 |
| Feb | 17 | M | Mann-Whitney U, Spatial Data | 5 | 5 | |
| Feb | 19 | W | <i>SPSS: 1 and 2 Sample Tests</i> | 5 | 6 | |
| Feb | 24 | M | Parametric AOV | 6 | SPSS 4 | Mini 3 |
| Feb | 26 | W | <i>SPSS: AOV</i> | 6 | 7 | |
| Mar | 2 | M | Non-Parametric AOV [Take Home test] | 6 | | |
| Mar | 4 | W | Review: Test 1 | | 8, SPSS 5 | |
| Mar | 18 | M | Test 1 [Take Home test due] | | | |
| Mar | 23 | W | Pearson's Correlation | 7 | | |
| Mar | 25 | M | Spearman's Correlation | 7 | 9 | |
| Mar | 30 | W | <i>SPSS: Correlation</i> | 7 | 10 | |
| Apr | 1 | M | Intro to Regression | 8 | SPSS 6 | |
| Apr | 6 | M | Regression Analyses | 8 | 11 | |
| Apr | 8 | W | <i>SPSS: Regression</i> | 9 | 12 | Mini 4 |
| Apr | 13 | M | Spatial Patterns | 9 | SPSS 7 | |
| Apr | 15 | W | Directional Statistics | 10 | 13, 14, 15 | |
| Apr | 20 | M | Time Series | 10 | 16, 17 | |
| Apr | 22 | W | <i>SPSS: Time Series</i> [Take Home test] | | | |
| Apr | 27 | M | Review: Test 2 | | SPSS 9 | |
| Apr | 29 | W | Test 2 [Take Home test due] | | | |

[†]These dates denote when the exercises are DUE.

[‡] Note that mini labs are to be completed, but there is no assignment to hand in.