

Statistical Research Methods in Geography, Geography 3190

Spring 2014: TTh 2 – 3:20 pm

Lab 1: Friday 9 – 9:50 am, Lab 2: Friday 10 – 10:50 am

Lecture in ENV 345, Labs in ENV 336

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TA Information

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Office Hours: M 1- 3 pm; F 11am - Noon

COURSE OBJECTIVES:

This course is designed to immerse students in descriptive and inferential statistics in a problem-oriented research context, primarily within geography. In order to succeed in the course, students must comprehend and be able to communicate the complete analytical process from:

Framing a research question

Generating statistical hypotheses related to that research question

Choosing the appropriate statistical test to test those hypotheses

Interpreting results of the statistical test

Drawing conclusions from the analysis

Students who fully understand the subject matter should be able to accomplish each of these tasks by the end of the class and should be able to read and comprehend analytical publications including scholarly journal articles and research reports that incorporate the use of basic quantitative analyses.

REQUIRED TEXT:

Cronk, B. C. 2012. *How to Use SPSS, 7th Edition*. Pyrczak Publishing, Glendale, CA.

GRADING BREAKDOWN

4 Exams @ 50 pts each	= 200 pts
4 Mini-reports @ 50 pts each	= 200 pts
4 Practicae @ 50 pts each	= 200 pts
3 Notebook sections @ 50 pts each	= 150 pts
1 Final Notebook @ 100 pts	= 100 pts
1 cumulative final exam @ 300 pts	= 300 pts
<u>Total</u>	<u>= 1150 pts</u>

Reports

The mini-reports are projects done in *groups of three to four*. Groups will be shifted for each project, and reports are authored by the group members together, who share the grade. In the past, some members have not done their part; members may convene and vote to remove an individual who is not contributing from the team up to three days prior to the due date. Removal of a team member requires a meeting of the group with Dr. Wolverton. If the individual in question does not attend the meeting, she/he can still be removed from the team and will be notified by Dr. Wolverton via email.

Exams

Exams are individual, and each exam is cumulative, building on the material that precedes the current section of the class. The instructor keeps the Exams after grades have been disseminated.

Final Graded Material

Final Exam = Cumulative Short Answer Exam on choosing appropriate tests; includes knowing all null and alternative hypotheses and all test statistics for all tests.

Final Notebook = a compilation of all lecture notes, all projects, all quiz material, and all documents from the class in an organized, neat, three ring binder.

In-class Policies

The practicae are open notebook and open book.

You may use a calculator for all tests.

PowerPoints will rarely be used in this class. The entire class is project-based; all lessons will be taught around working with datasets for mini-projects. Lectures will combine brief introductions of relevant material using the greaseboard, but will be brief and spotty. Much of the class will be based on in-class group work and discussion.

LEARNING BLOCK SCHEDULE (all exam and due dates are subject to change as the course proceeds)

Block 1 – Statistical Description

Goals

- 1) Learn parametric and non-parametric forms of description
- 2) Apply descriptive statistics and five types of graphs to summarize data
- 3) Learn to write about descriptive statistics and graphs

Time to learn = 3 weeks

Products = 1 mini report, Exam 1, Practicum 1

January 31st, Practicum 1

February 4th, Exam 1

February 6th, Report 1 due

Block 2 – Probability

Goals

- 1) Learn to use curves to think about probability of events
- 2) Learn to create confidence intervals using probability curves
- 3) Learn to use probability curves to test null hypotheses

Time to learn = 2 weeks

Products = Exam 2, Notebook Section 1

February 20th Exam 2

February 20th Notebook Section 1 due

Block 3 – Inferential Tests of Difference

Goals

- 1) Learn parametric and non-parametric tests of difference
- 2) Learn the null and alternative hypotheses for each test
- 3) Learn test statistics for each test
- 4) Reinforce using probability to test null hypotheses
- 5) Learn to write about results of tests of difference

Time to learn = 3 weeks

Products = 1 mini report, Exam 3, Practicum 2, Notebook Section 2

March 6th, Notebook Section 2 due

March 7th, Practicum 2

March 24th, Report 2 due

March 26th, Exam 3

Block 4 – Categorical Tests

Goals

- 1) Learn about Chi-square
- 2) Learn χ^2 Goodness of Fit tests
- 3) Learn χ^2 Test of Independence
- 4) Learn how to write about results of Chi square tests

Time to learn = 3 weeks

Products = Practicum 3, mini report 3

April 2nd, Practicum 3

April 7th, Report 3 due

Block 5 – Inference using Correlation and Regression

Goals

- 1) Learn about independent and dependent variables
- 2) Learn parametric and non-parametric correlation

- 3) Learn how regression differs from correlation
- 4) Learn how to write about results of correlation and regression

Time to learn = 3 weeks

Products = 1 mini report, Exam 4, Practicum 4 (cumulative), Notebook Section 3

April 25th, Practicum 4

April 29th, Exam 4

May 1st, Report 4 due

May 8th, Notebook Section 3 due

Cumulative Final Exam Thursday May 8th, 1:30-4:30 pm

DROPPING LOWEST SCORES

Students may earn the right to drop her/his lowest practicum score, her/his lowest quiz score, his/her lowest notebook section score, and/or her/his lowest report score in by doing the following.

- 1) The UNT Learning Center offers Learning 101 workshops multiple times per week: see <http://learningcenter.unt.edu/learning101>
- 2) Students may take up to four different workshops: learning styles, note-taking, test taking, and time management.
- 3) Note-taking must be one of the workshops taken (do it first).
- 4) Note-taking counts to drop the lowest notebook score, test-taking counts to drop the lowest quiz score, learning styles count to drop the lowest practicum, and time management counts for dropping the lowest report score.
- 5) To qualify, all workshops must be taken by March 26th.
- 6) You must get the TLC Form signed by the workshop instructor.
- 7) The final exam and the final notebook scores may not be dropped.

Matrix Summary of Comparative Methods

Number of Samples	Type of Test		
	Non-Parametric		Parametric
K	X^2 K-Sample Test	Kruskal-Wallis H-test	Analysis of Variance
2	X^2 Two Sample Test	Mann-Whitney U-test	t-test of difference between means
1	X^2 One Sample Test	Kolmogorov- Smirnov D-Test	t-test
Relationships and Trends	N/A	Spearman Rank Correlation	Product-Moment Correlation Simple Linear Regression
Measurement Scale	Nominal	Ordinal	Interval/Ratio

Adapted from Shaw and Wheeler, *Statistical Techniques in Geographical Analysis*.

Email received in August from Spring 2009 Student

Dear Dr. Wolverton,

I would like to thank you so much for serving as a reference for my interview with Wood Mackenzie. They offered me the job and I accepted about two weeks ago. I've already moved to the Houston area and start on August 17th.

Many of the skills that I acquired from your course proved to be extremely valuable for the interview. Before the interview started, they had me perform quantitative analysis on energy and pricing data for the North American power grid that I would present to the manager and head analysts in a powerpoint presentation. If it had not been for the knowledge that I gained from your course, the interview might have been over at that point. In fact, the head analyst complemented me for including a wider variety of statistical information than any of the other candidates.

Thank you so much again for serving as a reference and for teaching the Quantitative Methods course, without which, I may have never landed this job.

Best Regards,

Student

I promised the student they would remain anonymous.

POLICIES

EXTRA CREDIT

The Department of Geography does not allow extra credit assignments (work not specified on a course syllabus).

ACCOMODATIONS

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at 940.565.4323.

ACADEMIC DISHONESTY

Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. Additionally, the incident will be reported to the Office of Student Rights and Responsibilities for further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to: (a) use of any unauthorized assistance in taking quizzes, tests, or examinations; (b) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (c) the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; (d) dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or (e) any other act designed to give a student an unfair advantage. Altering a returned test and claiming a grader or scanning machine made an error is also considered cheating. The term "plagiarism" includes, but is not limited to: (a) the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and (b) the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

ACCEPTABLE STUDENT BEHAVIOR

Remember that you have agreed to follow the UNT Code of Student Conduct. “Student behavior that interferes with an instructor’s ability to conduct a class or other students’ opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Center for Student Rights and Responsibilities to consider whether the student’s conduct violated the Code of Student Conduct. The university’s expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc.” Again, the Code of Student Conduct can be found at http://conduct.unt.edu/student_conduct.

CLASSROOM COURTESY

Please follow these guidelines to avoid disrupting the class.

- (1) Turn off cell phones before arriving and do not text in class.
- (2) Do not arrive late or leave early (except for a bathroom break or emergency).
- (3) Do not sleep during class.
- (4) Do not work on other assignments during class.
- (5) Do not talk or whisper to neighbors (except for formal class interaction).

ATTENDANCE/TARDINESS POLICY

After missing (*excused* or *unexcused*) 5 class periods a student will receive a WF (F if after the WF deadline) for the course. Students who are greater than 5 minutes late should come to class so as not to miss the material, but they will be counted absent for the period.

MISSED-CLASS POLICY

Neither the professor nor the TA re-teaches the course outside of lecture or lab; we are happy to answer questions, clarify content, and provide guidance for those who attend class and come in with informed questions after they have attempted the work themselves. Students who miss class must secure notes from another student in the class; notes will not be provided by the instructor.

SUCCEED AT UNT

The following six practices enhance student success.

- Show Up
- Find Support
- Take Control
- Be Prepared
- Get Involved
- Be Persistent

Please see www.succeed.unt.edu for more information