College of Science
GGS 300 Quantitative Methods for Geographical Analysis GGS 300-001
Course Syllabus

Associated Term: Fall 2013
Registration Dates: Apr 09, 2013 to Sep 03, 2013
Drop without Tuition Penalty Dates: Apr 09, 2013 to Sep 03, 2013
Drop with Tuition Penalty (and final drop deadline) Dates: Sep 04, 2013 to Sep 27, 2013
Levels: Non-Degree, Undergraduate, Consortium
Attributes: Undergraduate - Upper Division
Instructors: Nigel Waters (P)
Fairfax Campus
Lecture Schedule Type
3.000 Credits
CRN: 72882

Course Instructor: Dr. Nigel Waters
E-mail: nwaters@gmu.edu
Phone: 703-993-4687
Course Web Page: On Blackboard

Class Location: Exploratory Hall 2310
Class Times: Tuesdays/Thursdays, 3.00 to 4.15pm
Class Dates: Aug 26, 2013 - Dec 18, 2013
Office Hours: 1-3pm Tuesdays and Thursdays or by Appointment

Required Texts:
McGrew, J. C. and Monroe, C. B. 2000. An Introduction to Statistical Problem Solving in Geography **(Second Edition).** McGraw-Hill, New York. **ISBN:** 0697229718 **May be Available in the Bookstore new or second hand. Or buy online at Amazon – hardback or softcover (the former is often cheaper BUT MAKE SURE YOU GET THE SECOND EDITION).**

Other Requirements: Flash drive/memory stick.

Course Overview: A survey of quantitative methods commonly used in geographic research. Emphasizes spatial analysis techniques.

Course Objective/Outcomes:
i) to provide students with the ability to conduct rigorous statistical analysis of data commonly encountered in geographical research using a widely available statistical package; and
ii) to provide students with the ability to understand statistical analysis commonly encountered in geographical research and the geographical scientific literature.

Course Assignments and Expectations: Lab assignments will be based on the lecture material previously delivered and available as Power Points on Blackboard. Each lab assignment will be due one week after it is assigned (and at the start of the lecture). Late labs will only be marked for the usual documented medical reasons or by previous agreement with the instructor. Deployment of any family member is, of course, an acceptable reason for special arrangements to be made.

Course Grading:

Lightning Talk: 10 minute Power Point presentation on a published paper using statistical analysis 10%
Approx. Ten Lab Exercises 4% each
Project Presentation 10%
Class participation (answer 10 questions in class): 10%
Term Project 30% (due Monday, Dec. 9th, submitted to the Blackboard)

There is no final examination for this course. However, in order to pass the course you must receive a passing grade in the labs.

All parts of the course are graded with a letter grade e.g. A+ B C- etc. Final mark is calculated using the Grade Point equivalent for each component of the course i.e. A is 4, A- is 3.7, B+ is 3.3, etc.

Lectures and (Labs)

Date Topic

8/27 T Lec 1: Introduction to the Course
Ch 1: of the Textbook: The Context of Statistical Techniques
8/29 R Lec 2: Ch 2: Characteristics of Geographic Data: Concepts;
9/3 T Lec 3: Ch 3: Descriptive Statistics; *Lightning Talk*
9/5 R Lec 4: Ch 4 Descriptive Spatial Statistics; *Lightning Talk*
Lab 1: Context for Statistical Analysis: Questionnaires and Surveys
9/10 T Lec 5: Ch 5 Probability; *Lightning Talk*
9/12 R Lec 5 Probability Continued; **Lab 2: Data Presentation & Description with SPSS**
9/17 T Lec 6: Ch 6: Sampling; *Lightning Talk*

9/19 R **Lab 3: Data Description Using SPSS (continued); Probability Theory**
9/24 T Lec 7: Ch 7: Estimation in Sampling; *Lightning Talk*
9/26 R Lec 7 Continued; **Lab 4: SPSS, Normal Distribution; Standard Error of the Mean**
10/1 T Lec 8: Ch 8 Elements of Inferential Statistics; *Lightning Talk*
10/3 R Lec 8 Contd.; **NO LAB**

10/8 R Lec 9: Ch 9 Two Sample and Matched Pairs Difference Tests; *Lightning Talk*
Lab 5: Chi-Square One-Sample Goodness-of-Fit Test; Two Sample Difference Tests
10/10 T Lec 9 Contd.;

10/15 T Because of Columbus Day on 14th NO TUESDAY LECTURES October 15th

10/17 R Lec 10: Ch 10 Three-or-More sample Difference Tests: Analysis of Variance; *Lightning Talk*
Lab 6: Wilcoxon-Mann-Whitney Test for Two Independent Samples (using SPSS); Chi-Square 2 to K Sample Test (Contingency Table Analysis)
10/22 T Lec 10 Contd.;
10/24 R **Lab 7: One and Two Way Analysis of Variance Using SPSS**
10/29 T Lec 11: Ch 11 Goodness-of-Fit Tests and Categorical Difference Tests; *Lightning Talk*
10/31 R Lec 11 Contd.; **Lab 8: Point Pattern Analysis: Quadrat Method**
11/5 T Lec 12: Ch 12 Inferential Spatial Statistics; *Lightning Talk*
11/7 R Lec 13 Ch 13 Correlation; **Lab 9: Nearest Neighbor and Correlation Analysis**
11/12 T Lec 14: Ch 14: Regression; *Lightning Talk*
11/14 R Lec 14 Ch 14: Regression and Regression Assumptions Continued; *Lightning Talk*

Lab 10: Regression Analysis

11/19 T Lec 15 Ch 15 Epilogue: Statistical Problem Solving in Geography

11/21 R 1st Group: 10 Minute, Project Presentations; 8 Power Point Slides Maximum; Submission of Power Point Slides to Blackboard by Wednesday, November 20th

11/26 T 2nd Group: 10 Minute, Project Presentations; 8 Power Point Slides Maximum; Submission of Power Point Slides to Blackboard by Monday, November 25th For second group

11/28 R Thanksgiving Recess: NO LECTURE

12/3 T 3rd Group: 10 Minute, Project Presentations; 8 Power Point Slides Maximum; Submission of Power Point Slides to Blackboard by Wednesday, December 2nd For third group

12/5 R 4th Group: 10 Minute, Project Presentations; 8 Power Point Slides Maximum; Course Evaluations

12/9 M Papers Due by Electronic Submission to BLACKBOARD – No Extensions; earlier submission would be appreciated (No Final Exam)

ACADEMIC INTEGRITY

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

GMU EMAIL ACCOUNTS

Students must use their Mason email accounts—either the existing "MEMO" system or a new "MASONLIVE" account to receive important University information, including messages related to this class. See http://masonlive.gmu.edu for more information.

OFFICE OF DISABILITY SERVICES

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

OTHER USEFUL CAMPUS RESOURCES:

WRITING CENTER: A114 Robinson Hall; (703) 993-1200;
http://writingcenter.gmu.edu

UNIVERSITY LIBRARIES "Ask a Librarian"
http://library.gmu.edu/mudge/IM/IMRef.html

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380;
http://caps.gmu.edu

UNIVERSITY POLICIES
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.