

College of Science
GG5 560 Quantitative Methods GGS 560-001
Course Syllabus

Associated Term: Spring 2014

Last day to add classes or drop with no tuition penalty: January 28th, 2014

Levels: Graduate

Instructors: Nigel Waters (P)

Fairfax Campus

Lecture Schedule Type

3.000 Credits

CRN: 12665

Course Instructor: Dr. Nigel Waters

E-mail: nwaters@gmu.edu

Phone: 703-993-4687

Office: 2405 Exploratory Hall (Sci & Tech II)

Course Web Page: On Blackboard

**Office Hours: Tuesday 2 to 4pm; Thursday 2 to 3pm;
or by appointment whenever convenient for you and me.**

Class Location: Exploratory Hall 2103

Class Times: Tuesdays 4.30 to 7.10pm

Class Dates: Jan 21, 2014 - May 14, 2014

For a list of Important Calendar Dates see: <http://registrar.gmu.edu/calendars/2014spring/>

Suggested Text:

Davis, John C. 2002. Statistics and Data Analysis in Geology (Third Edition). Wiley, New York.

Supplementary text: Tabachnick, Barbara G. and Fidell, Linda S. 2006/2012. Using Multivariate Statistics. Allyn and Bacon, 5th or 6th Edition, New York.

Other Requirements: Flash drive/memory stick.

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

Course Objective/Outcomes:

To provide students with the ability to conduct rigorous statistical analysis of data 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:

Approx. Ten Lab Exercises	40% in total
Lightning Talk: 10 minute Power Point presentation on a published paper using statistical analysis	10%
Project Presentation	10%
Class participation (answer 10 questions in class):	10%
Term Project	30% (due Wednesday, May 7 th)

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+ A A- B+ B B- C+ C C- etc.

Lectures and (Labs) and Tests

<u>Date</u>	<u>Topic</u>
1/21 T	Lec 1: Introduction to the Course; Elementary matrix algebra; Elementary Statistics
1/28 T	Lec 2: Elementary Statistics Continued; Sampling; digression on Cod and Iraq; ANOVA Lab 1: One Way and Two Way ANOVA; SPSS
2/4 T	Lec 3: Lec 3: Simple Regression; Polynomial Regression Lab 2: Simple and Polynomial Regression; SPSS
2/11 T	Lec 4: Multiple Regression/Logistic Regression Lab 4: Multiple/Logistic Regression; SPSS
2/18T	Lec 5: Lec 5: Spatial Interpolation: Trend Surface Analysis Lab 4: Trend Surface Analysis; ArcGIS
2/25 T	Lec 6: Geographically Weighted Regression Lab 5: Geographically Weighted Regression; ArcGIS
3/4 T	Lec 7: Spatial Autocorrelation; LISA; Spatial Regression Lab 6: Spatial Autocorrelation; LISA; Spatial Regression; GeoDa

March 10th - 16th Spring Break: No Lectures

3/18T	Lec 9: Factor Analysis and Principal Component Analysis Lab 8: Factor Analysis and Principal Component Analysis; SPSS
3/25 T	Lec 9: Cluster Analysis Lab 8: Cluster Analysis; SPSS
4/1 T	Lec 10: Discriminant Analysis Lab 9: Discriminant Analysis; SPSS
4/8 T	Lec 11: Cluster Analysis; Multidimensional Scaling; Lab 10: Cluster Analysis & Multidimensional Scaling using SPSS
4/15 T	Submission of Power Point Slides to Blackboard by Monday, April 21st for the first group; 7 Slides Each
4/22 T	8 Minute, Project Presentations (Group 1);

Submission of Power Point Slides to Blackboard by Monday, April 28th for the second group; 7 Slides Each

4/29 T 8 Minute, Project Presentations (Group 2)

5/7 W Papers Due by Electronic Submission *on the Blackboard* by 11.59pm– No Extensions (except for the usual reasons: illness, bereavement, deployment of you or a close family member, or with special permission from the instructor or by approved accommodation); *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.