

**College of Science**  
**GGG 300: Quantitative Methods for Geographical Analysis**  
**Course Syllabus**

Associated Term: Fall 2019  
Levels: Non-Degree, Undergraduate, Consortium  
Attributes: Undergraduate - Upper Division  
Instructors: Donglian (Lillian) Sun (P)  
Fairfax Campus  
Lecture Schedule Type  
3.000 Credits  
CRN: 71719

**Course Instructor: Dr. Donglian (Lilian) Sun**

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Office: Exploratory Hall #2407

Phone: 703-993-4736

Office hours : 2.00-4.00 PM on Wednesday or by appointment

Course Web Page: <http://courses.gmu.edu>

Class Location: Exploratory Hall 2310

Class Times: 3:00 p.m. to 4:15 p.m. every Tuesday and Thursday

Class Dates: August 26 to December 18, 2019

**Required Texts:**

McGrew, J.C., Lembo, A.J., and C.B. Monroe. 2014. An Introduction to Statistical Problem Solving in Geography (Third Edition). Waveland Press, Inc., Illinois. ISBN: 1478611197  
Make sure to get the Third Edition! Available at the GMU Bookstore or order online at [www.waveland.com](http://www.waveland.com)

**Other Requirements:** Flash drive/memory stick.

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

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:**

Initial Test 5%

(Each student will be awarded 5% for completing this test i.e. every student will get an A since I simply want to see what you know at the start of the course)

Attendance 10%

Lab Exercises 30%

Mid-term Exam 25%

Final Exam 30%

All parts of the course are graded with a letter grade e.g. A+ B C- etc. For the multiple choice tests and labs letter grades are assigned as follows:

**A+ 95% and over or top mark; A 91 to 94; A- 87 to 90**

**B+ 85 to 86; B 81 to 84; B- 75 to 80**

**C+ 67 to 74; C 64 to 66; C- 60 to 63**

**D+ 57 to 59; D 50 to 56; F less than 50**

**CLASS SCHEDULE (subject to change)**

**note: the Lab dates below refer to the date they will be assigned!**

Schedule

**Lecture I**

**Introduction to the Course**

**Benchmark Test to Establish Student's Level of Knowledge**

McGrew, Ch 1: The Context of Statistical Techniques

**Lecture II**

**Characteristics of Geographic Data: Concepts**

McGrew, Ch 2

**Lecture III**

**Descriptive Statistics**

McGrew, Ch 3

**Lecture IV**

**Descriptive Spatial Statistics**

McGrew, Ch 4

Lab 1: Context for Statistical Analysis: Questionnaires and Surveys

**Lecture V**

**Probability**

McGrew, Ch 5

Lab 2: Data Presentation & Description with SPSS

**Lecture VI**

**Sampling**

McGrew, Ch 6

Lab 3: Data Description Using SPSS (continued); Probability Theory

**Lecture VII**

**Estimation in sampling**

McGrew, Ch 7

Lab 4: SPSS, Normal Distribution; Standard Error of the Mean

**Lecture VIII**

**Elements of Inferential Statistics**

McGrew, Ch 8

Prepare for mid-term

**Lecture IX**

**Two Sample and Matched Pairs Difference Tests**

McGrew, Ch 9

Lab 5: Chi-Square One-Sample Goodness-of-Fit Test; Two Sample Difference Tests

## **Lecture X**

### **Three-or-More sample Difference Tests: Analysis of Variance**

McGrew, Ch 10

## **Lecture XI**

### **Goodness-of-Fit Tests and Categorical Difference Tests**

McGrew, Ch 11

Lab 6: Wilcoxon-Mann-Whitney Test for Two Independent Samples (using SPSS); Chi-Square 2 to K Sample Test (Contingency Table Analysis).

## **Lecture XII**

### **Inferential Spatial Statistics**

McGrew, Ch 13 and 14

Lab 7: One and Two Way Analysis of Variance Using SPSS

## **Lecture XIII**

### **Correlation**

McGrew, Ch 16

## **Lecture XIV**

### **Regression**

McGrew, Ch 17

Lab 8: Correlation and Regression Analysis

## **Lecture XV**

### **Multiple Regression**

Cluster Analysis

McGrew, Ch 18

## **Lecture XVI**

### **Epilogue: Statistical Problem Solving in Geography**

Final Project

## **Student Resources:**

- **Academic Integrity:** Students must be responsible for their own work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be a foundation of our university culture. [See <http://academicintegrity.gmu.edu/distance/>].
- **Honor Code:** Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/the-mason-honor-code/>].
- **MasonLive/Email (GMU Email):** Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. [See <https://masonlivelogin.gmu.edu>].
- **Patriot Pass:** Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Blackboard, University Libraries, MasonLive, myMason, Patriot Web, Virtual Computing Lab, and WEMS. [See <https://password.gmu.edu/index.jsp>].

- **University Policies:** Students must follow the university policies.  
[See <http://universitypolicy.gmu.edu>]. Responsible Use of Computing - Students must follow the university policy for Responsible Use of Computing. [See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing>].
- **University Calendar:** Details regarding the current Academic Calendar.  
[See <http://registrar.gmu.edu/calendars/index.html>].
- **Students with Disabilities:** Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu>].
- Students are expected to follow courteous Internet etiquette at all times; see <http://www.albion.com/netiquette/corerules.html> for more information regarding these expectations.

## 2. Student Services:

- **University Libraries:** University Libraries provides resources for distance students.  
[See <http://library.gmu.edu/distance> and [http://infoguides.gmu.edu/distance\\_students](http://infoguides.gmu.edu/distance_students)].
  - **Writing Center:** The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. [See <http://writingcenter.gmu.edu>]. You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the [Online Writing Lab \(OWL\)](#).
  - **Counseling and Psychological Services:** The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu>].
  - **Family Educational Rights and Privacy Act (FERPA):** The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. [See <http://registrar.gmu.edu/privacy>].
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**Disclaimer:** Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported by the instructor.