

GGS 300: Quantitative Methods for Geographical Analysis

Course Syllabus, Fall 2020, 3 Credits

INSTRUCTOR

Name: Dr. Edward Oughton

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COURSE BASICS

Location: Remote, 100% asynchronous

Web location: Blackboard

PRE-REQUISITES 30 credits, including GGS 102 and 103 or permission from the instructor.

TEXTBOOK

No required textbook, but it is advisable to get McGrew et al. (2014) and/or Dadson (2017):

McGrew, Lembo, and 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 at www.waveland.com*

Dadson, S.J., 2017. Statistical Analysis of Geographical Data: An Introduction. John Wiley & Sons.

OVERVIEW & OBJECTIVES

GGS 300 introduces students to the use of statistical techniques and quantitative methods within the spatial sciences. The aim will be to enable you to think and engage critically with statistical data, given we encounter this type of information daily (e.g. in the media, workplace, on a smartphone etc.). The course focuses on the basic components of quantitative spatial research, such as (i) developing research questions, (ii) evaluating research questions via formal hypothesis testing, and (iii) interpreting the results of statistical tests (including the redevelopment of research questions). Students will learn how to:

- Conduct rigorous statistical analysis of data and information commonly encountered in spatial science using industry-standard statistical software.
- Interpret statistical analysis techniques in geographic research and the broader scientific literature.
- Think critically about the use and misuse of statistics!

GGS COMPUTER LAB, ASSIGNMENTS, & EXPECTATIONS

GGS 300 Students have remote access to the GGS Virtual Computing Lab with the software required for this course ([R Studio](#)).

Lab assignments will be based on the lecture material and will be administered via Blackboard. Lab assignments will be set on Thursdays and will be due the following week *prior to the start of the lecture* (except where noted in the Course Schedule). Late labs will be penalized 20% for each day late. Late submissions will only go unpenalized for the usual documented medical reasons or by previous agreement with the instructor.

GRADING		
Assessment	Points	% (of final grade)
Lab Assignments (10)	200	50%
Midterm Exam	100	25%
Final Exam	100	25%

Grades will be based on the following cutoff values, although I reserve the right to alter the values at the end of the course: A (93%), A- (90%), B+ (87%), B (83%), B- (80%), C+ (77%), C (73%), C- (70%), D (60%)

The midterm exam will cover the first half of the course. The final exam will be semi-comprehensive, focusing on the second half of the course, but also covering key topics from throughout the entire semester. There will be ungraded pop quizzes during the semester. The quizzes will be used to evaluate how well the course information is being presented and retained; they also provide an opportunity to preview potential exam questions.

OUTLINE & SCHEDULE (subject to change)

NOTE: The dates below refer to when the lab assignments are set!

Week number	Week commencing	Lecture topic	Readings / Assignments
1	Aug-24	Intro to quant methods	McGrew, Chapter 1
2	Aug-31	Types of data	McGrew, Chapter 2
3	Sep-07	Descriptive statistics	McGrew, Chapter 3
4	Sep-14	Spatial descriptive statistics	McGrew, Chapter 4
5	Sep-21	Probability	McGrew, Chapters 5 & 6
6	Sep-28	Sampling - Part 1	McGrew, Chapter 7
7	Oct-05	Sampling - Part 2	McGrew, Chapter 8
8	Oct-12	Inferential statistics	McGrew, Chapter 9
9	Oct-19	Inferential statistics	McGrew, Chapter 10
10	Sep-26	ANOVA	McGrew, Chapter 11
11	Nov-02	Categorical Difference	McGrew, Chapter 12
12	Nov-09	Inferential spatial statistics	McGrew, Chapter 13-15
13	Nov-16	Correlation	McGrew, Chapter 16
14	Nov-23	Thanksgiving - No classes	McGrew, Chapter 17
15	Nov-30	Regression	McGrew, Chapter 18

COURSE RESOURCES

Content for GGS300 will be available on Blackboard, otherwise known as myMason. You will need to have access to a computer with a stable Internet connection capable of streaming video. It is also useful to have a web camera with a microphone for any additional Zoom sessions.

OFFICE HOURS AND INSTRUCTOR INTERACTION

There are currently no set office hours, so instructor interaction is by appointment. When emailing, a timely response is expected Monday-Thursday. Please ensure your email questions are succinct. Phrasing questions to enable the instructor to make a swift response is likely to increase the efficiency of an answer.

ACADEMIC INTEGRITY

GMU has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged, with the expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions.

GMU EMAIL ACCOUNTS

Students must use their MasonLive email account to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

DIVERSITY

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty, and staff. Through its curriculum, programs, policies, procedures, services, and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds, and practices can be voiced, heard and respected.

The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found

with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach.

Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate diversity and inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

In this regard, should you have any comments or feedback that you wish to raise about GSS300, please do let the instructor know as your feedback is incredibly valuable and important!

OFFICE OF DISABILITY SERVICES

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

STUDENTS AS SCHOLARS

Students as Scholars is GMU's award-winning initiative to give students the opportunity to conduct undergraduate research. If you are interested in conducting research or simply learning more about the program, check out oscar.gmu.edu or stop by the Office of Student Scholarship, Creative Activities, and Research to learn about the many programs available to GMU students.

GMU RESOURCES

The Writing Center: <https://writingcenter.gmu.edu>

University Libraries, Ask a Librarian: <https://library.gmu.edu/ask>

Counseling and Psychological Services: <https://caps.gmu.edu>

University Catalog: <https://catalog.gmu.edu>

University Policies: <https://universitypolicy.gmu.edu>