

GGG 463 / 653: Applied GIS / Geographic Information Analysis

Course Syllabus, Spring 2020, 3 Credits

INSTRUCTOR

Name: Dr. Timothy Leslie
Office: 2207 Exploratory Hall
Email: tleslie@gmu.edu
Phone: 703-993-4336

COURSE BASICS

Meeting times: W 4:30 - 7:10pm
Location: 2310 Exploratory Hall
Web location: Blackboard (mymasonportal.gmu.edu)
Office hours: By appt.

PRE-REQUISITES

GGG 311 / 553 - Geospatial Information Systems
(or previous coursework/experience in GIS)

GGG 300 / 560 - Quantitative Methods (or a comparable statistics/methods course)

SUGGESTED TEXTS

No required textbook. Additional readings will be available via Blackboard. Students will also be responsible for gathering peer-reviewed articles for use in a literature review.

OVERVIEW & OBJECTIVES

Applying GIS through analysis is the art and science of investigating and sharing patterns in spatial data. This course explores existing and potential capabilities of geographic information systems in conducting spatial analysis and modeling. An emphasis is placed on how geographic information analysis is used in the larger process of conducting scientific research, as the machines and algorithms can give you an answer, but they are not good at knowing if it is useful or correct. Throughout the course, students are required to complete a rigorous, high-quality research project of their own choosing to apply quantitative data to real world problems and accurately state what the data tells us about the problem at hand. Weekly material will cover how geographic information and GIS are used throughout the research process, as well as more advanced applied GIS topics such as spatial statistical analysis, temporal analysis, and data visualization.

STUDENT EXPECTATIONS

Within the classroom, you are expected to be respectful of your peers and your instructor in both words and actions. This ranges from classroom interactions to the simple act of showing up to class on time. Coming late to class disturbs class activities and the learning process and is exacerbated by the room structure.

- You are expected to come to class prepared to learn and engage.
- 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.
- Cell phones and other communicative devices are not part of the pedagogical elements of this course. Please keep them stowed away and out of sight. Such disruptions show a lack of professionalism.
- While this is a computer classroom, the computers are for the purpose of furthering your geographic education related to this course. You are expected to not engage in activities that are unrelated to the class.

This class is designed for students with an understanding of geographic information systems, and your work should be done neatly, professionally, and show attention to detail. Grading emphasis will be focused on the quality and completeness of your submissions.

My last name is pronounced LESS-LEE. My preference is that you address me as “Professor,” “Professor Leslie” or “Dr. Leslie.” If there is a specific way that you would like me to address you—including certain pronouns—please notify me as soon as possible.

Video and/or audio recording is permitted only with the prior written consent of the professor or if recording is part of an approved accommodation plan.

Students are required to obtain a high-quality spatial data set, develop a research question, complete an analysis, and communicate their findings. Evaluation of the project will be distributed throughout several updates and submissions.

Collaboration is encouraged (and in some situations mandatory). I strongly encourage you to work people who are not part of your in-group. Similarly, I encourage you to form study groups, compare notes, and discuss ideas in spaces besides the classroom.

INSTRUCTOR AVAILABILITY

There are no scheduled office hours for this course. Appointments are available by mutual convenience and are arranged by e-mail. Please do not hesitate to contact your instructor if you have questions about course topics or assignments. As email accessibility can be variable during the day, due-day questions regarding lab assignments or exam content should be sent with tempered expectations.

COURSE ASSESSMENT

You will be assessed in your attainment of the course learning outcomes through several methods. The groupings and weights of those assessments are listed below.

Undergraduate Assessment	% (of final grade)	Graduate Assessment	% (of final grade)
Final Exam	45%	Final Exam	30%
Post-Class Engagement Activity	10%	Post-Class Engagement	10%
Project Elements	45%	Project Elements	60%

Grades generally follow 90/80/70/60 with plus/minus being within 3 percent of the cutoffs. I reserve the right to alter the exact boundaries at the end of the semester. If you are not satisfied with your progress during the semester, please see me as early as possible; do not wait until the end of the semester to address these concerns.

Many course sessions will be followed by a post-class engagement activity. These will involve methodological elements of that day’s course content. These participatory elements are intended to reinforce the concepts and to get you immediately enmeshed into the methods of the course.

The exams will be a mix of multiple choice, true/false, fill in the blank, and free response. I **do not** provide review sheets for exams. No tests will be handed out after the first person to finish has turned in their exam and left the room.

Each student will participate in a course project. More specific information on the course project will be provided during the semester.

ELECTRONIC RESOURCES

You will need to be able to use a computer to participate in the course and complete the required work. This course requires notably computer file management skills and the ability to work within a computer environment without assistance. Many lab assignments will require several hours to complete, and you are encouraged to use the departmental computer lab (Exploratory 2102), which is available 24/7 (unless reserved). All students in GGS courses should automatically receive “swipe” access (using your Student ID) within the first two weeks of the course.

Students must use their GMU email account to receive important University information, including communications related to this class.

- If you are having problems with GGS Lab door access after the second week of classes, please e-mail GGS administrator Sam Cooke (scooke4@gmu.edu) with SWIPE ACCESS in the subject line of your email and the course to which you are enrolled in the email text along with a polite request for access.
- If you experience problems with the computers (e.g., software or hardware issues) in the GGS Student Computer Lab or in our classroom, please email College of Science IT (cosit@gmu.edu) for technical assistance.
- If you need a license key for a self-installed copy of ArcGIS, please e-mail Dr. Leslie.
- I will not respond to messages sent from or send messages to a non-Mason email address regarding course elements.
- Please copy Dr. Leslie on any e-mail correspondence to outside parties if it is related to this course.

You will likely want a thumb drive or some other form of portable (or easily accessible) storage device/service. Many of the files we will use are very large. I strongly suggest using a cloud service such as dropbox.com. Please save frequently while working in the lab (lab2a, lab2b, lab2c, for example) and definitely keep a backup copy of your work. Saving your work to a local machine is NOT a reliable method. There are no second chances for software or hardware glitches.

The course will be taught with the help of Blackboard, accessed through <https://mymasonportal.gmu.edu>. Blackboard will be used for the distribution of lectures and assignments, as well as for the post-class engagements.

- Preview slides will be posted before class to provide an opportunity for context, full lectures are available after class.
- While unlimited submissions are permitted in Blackboard, only the most recent submission will be graded.
- Unless otherwise specified, submissions should be PDF documents.

This class will teach the technical application elements in ArcGIS Desktop, the dominant software product used in the industry. You are free to use open source (QGIS), command line (R), or other software as you see fit.

- If you wish to obtain the software for your personal machine, other than connecting you with the license, such elements are outside the scope of course instruction.

I am not technical support.

ACADEMIC INTEGRITY

The integrity of the University community is affected by the individual choices made by each of us. GMU has an Honor Code with clear guidelines regarding academic integrity and dishonest practices. 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. Writers give credit through

accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using MLA or APA format (or similar).

While working on labs near other students is acceptable, creative efforts are to be individual to a student. You are responsible for making certain that there is no question that the work you hand in is your own. If only your name appears on an assignment, your professor has the right to expect that you have done the work yourself, fully and independently.

The principle of academic integrity is taken seriously, and violations are treated gravely. No grade is important enough to justify academic misconduct, and ignorance is not an excuse. It is my policy that all Honor Code referrals recommend a sanction of *at least* course failure. The official GMU policies are available from the Office of Academic Integrity: <https://oai.gmu.edu/>

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. We welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion, age, and disability.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals.

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 a multitude of opinions, backgrounds and practices have the opportunity to be voiced, heard and respected. We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own. Individuals are asked not to speak for the experience of others, nor to ask others to account for an identity to which they may belong.

OFFICE OF DISABILITY SERVICES

I am committed to the accessibility of education of all students. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University.

If you are seeking accommodations for this class related to any sort of disability, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Students who suspect that they have a disability, temporary or permanent, but do not have documentation are encouraged to contact DS for advice on how to obtain appropriate evaluation. I can only provide accommodations with the authorizing documentation from Disability Services.

OTHER GMU RESOURCES

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

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

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

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

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

OUTLINE & TENTATIVE SCHEDULE (subject to change)

	Date	Lecture Topic 1	Lecture Topic 2	DUE
1	22-Jan	Introduction, Spatial Data	Research Design	
2	29-Jan	Descriptive Statistics	Data Sections	Update 1: Lit Review
3	5-Feb	Point Patterns	Regression	Update 2: Data Check-in, Lit Review
4	12-Feb	Spatial Autocorrelation	Methodology Sections	
5	19-Feb	Time Analysis	Introduction Sections	
6	26-Feb	Grouping Analysis	Lit Reviews	Update 3: Project Framework
7	4-Mar	Interpolation & Kernel Density	Results Sections	Update 4: Methods, Lit Review
	11-Mar	<i>No Class - Spring Break</i>		
8	18-Mar	Categorical Analysis	Design, Posters	Update 5: Proposal Elements
9	25-Mar	Regression II	Cartographic Modeling	
10	1-Apr	Discussion and Conclusion Sections	Working in a Team, Abstracts	Update 6: Project Flow, Results
11	8-Apr	<i>No Lecture, In-Class Project Work Time</i>		Update 7: Project Work Distributions
12	15-Apr	Formatting for Journals	Peer Review	Draft Posters
13	22-Apr	Undertaking Revisions	Draft Poster Discussion	Peer Review, 10am
14	29-Apr	Ethics, Authorship	Summary	Final Posters
	6-May	FINAL EXAM		