
Course: GGS 310 (Online)

Website: <https://mymason.gmu.edu>

Section/Credits: DL1 / 3 credit hours

Teaching assistant: TBA

TA email: TBA

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Instructor office: EXPL 2413

Office hours: MWF 12 – 1 PM

Via Zoom

General Information

Catalog description: Study and creation of maps. Fundamental mapping principles (projection, scale, generalization, symbolization) and applied computer-based cartographic production.

Course overview: This course is focused in the science and art of creating maps. As a visual form of communication, it is important that geographers learn how to make “good” maps that are informative, creative, easy to understand, and aesthetically pleasing. By the end of the course, students will be able to both recognize good map design and also apply technical skills to create effective maps and graphics.

This course consists of two closely related components: lectures and labs. In lectures, students will learn cartographic theory and conventions. In labs, students will apply these principles of cartography, along with modern computer-based techniques, in ‘hands-on’ experience with ArcGIS and other software packages to create maps and graphics. Both lecture and lab will occur asynchronously in video recordings. Each week lectures will be offered as a set of videos broken into shorter sections, while labs will be one video that provides an overview of the assigned lab. See the schedule at the end of the syllabus for a specific schedule.

Online course: GGS 310 is presented as an asynchronous online course. “Asynchronous” means that there are no specific timed gatherings for this course (E.G.: we don’t meet for lectures at specific times like in-classroom courses). Still, there will be specific due dates for graded work in the course that you are expected to meet. It is incumbent upon each student to organize their time and work through materials in a timely and efficient manner.

The course has been designed in weekly segments (see the schedule at the end of the syllabus). Segments will be released in order in a prescribed manner. Students will not have access to the entirety of the course materials from the start; you will get the materials necessary for each week as the week approaches. This is done to ease logistical problems of students being at significantly different sections of the course. Please do not ask for advanced access to materials.

Target audience: This course is required for anyone majoring in geography and geoinformation science (both BS and BA GEOG degrees). The course is also accepted as an elective for the GIS minor. This course is appropriate for any student that wants to develop cartographic skills, enhance graphic design ability, and spatial thinking.

Applicable learning outcomes: Upon completion of this course, students should be able to:

- Understand scale, projections, generalization, classification, symbolization, and other basics of cartography
- Know how to properly place map elements for a balanced layout, creating ethical cartographic products utilizing principles of graphic design
- Understand how different media (paper, digital, animation) affect map clarity
- Possess the ability to critique maps
- Understand and be able to create various thematic maps, and choose which thematic map types (or graphic types) are appropriate for certain data or situations
- Be proficient in cartographic tools of ArcGIS

Course prerequisites: No prior coursework is required, but it is strongly suggested that students have basic computer skills and at least passing familiarity with GIS.

Enrollment and repeat policy: This course follows the general Mason policy that an undergraduate course can be repeated for grade up to three times. Understand that each academic unit can have more restrictive limits on specific courses. Students that repeat the course must submit all newly completed work.

Course Materials

Required text: Tyner, J. A. 2010. *Principles of map design*. New York: Guilford Press. ISBN 13: 978-1-462-51712-1

The course textbook is available from various outlets in various forms. It is available through the Mason bookstore or through your online provider of choice. The publisher sells an e-book version through their website (<https://www.guilford.com/books/Principles-of-Map-Design/Judith-Tyner/9781462517121/summary>) and VitalSource (<https://www.vitalsource.com/products/principles-of-map-design-tyner-judith-a-v9781609180317>). Presumably, other e-book providers also sell the text. In addition, there may be other readings posted on Blackboard for you to complete.

The Tyner text is available freely online through the GMU library. **However, access is limited so that only one student at a time can have online access.** You will need to use your Mason email account to log in for access. Below is a link to the book. Click the link (you may want to bookmark it) to bring up the library page. There is a section with the header “View Online”; click the link to “view full text” to access the book.

To access the Tyner text, use the following link: https://wrlc-gm.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma9935194163404105&context=L&vid=01WRLC_GML:01WRLC_GML&search_scope=MyInst_and_CI&isFrbr=true&tab=Everything&lang=en

GGIS computer lab and virtual computing: *Due to social distancing policies in Mason’s Safe Return to Campus, the lab in EXPL 2102 is closed for the Fall 2020 semester.*

Mason provides access to Mason Labs virtual computing through your web browser. In order to access it, you will need to install both a Mason VPN (<https://its.gmu.edu/service/virtual-private-network-vpn/>) and the Citrix Workspace app (<https://www.citrix.com/downloads/workspace->

[app/](#)). After logging into the VPN, you can then access <https://mymasonapps.gmu.edu/> using your Mason directory ID. Once inside, you will be able to access Mason Labs and have a virtual connection to a Mason lab computer with some specialized software. You can connect to the Microsoft One Drive cloud storage that each Mason student has or connect to local storage drives.

Software, hardware, and data: The main software used for this class is ArcGIS; in particular, we will be using ArcMap rather than ArcGIS Pro. We may also utilize other software in the context of this course, including Adobe products. Students are able to download an evaluation copy of ArcGIS for their own computer (Windows only) through a GMU Enterprise account. Instructions will be available on Blackboard.

Many of the files we will use are very large! You are encouraged to have a USB flash drive or portable hard drive in order to store and access files. 16 GB of storage or more is preferable. You may also use the drive to install some of programs we use. Cloud storage is another option, either to keep all your files or to use as a common backup.

You will create a video presentation of your final project. You will need a microphone or headset to complete this assignment. Many computers, especially laptops, have built-in microphones that should be sufficient, but you should test your hardware early.

The online nature of this class necessitates that students have the technological bandwidth to stream data; students should have regular, reliable access to a computer with an updated operating system and a stable broadband Internet connection (consistent 1.5 Mbps or higher download and upload speed; you can use <https://www.speedtest.net/> to check the speed of your connection)

Online materials and email: This course will make extensive use of Blackboard at Mason. Course materials such as assignments will be available only in electronic version on Blackboard. Also, students will be expected to submit assignments online through Blackboard. **Only Word document (.docx or .doc) or Adobe PDF (.pdf) file formats will be accepted**, with some exceptions. Grades will be posted on Blackboard as well. Make sure you are familiar and comfortable with the Blackboard interface.

Students are required to have a MasonLive/Email account, which will allow you access to Blackboard and lab computers. Please use this university email account when contacting the professor regarding this class; your professor will not respond to messages sent from a non-Mason email address.

Grading

Lab assignments (33%): Most weeks there will be a laboratory exercise. Labs are designed to apply the cartographic theories discussed in class in a hands-on environment. Work will typically be completed with ArcGIS. Each lab has a graded deliverable, typically in the form of a map. Labs will be due on Wednesday of the following week (by 11:59 PM). Labs will be submitted online through Blackboard, with potentially items due in hard copy. There will be ten (10) labs overall. Nine are one-week labs, while one is a two-week lab.

Midterm exam (8%): There will be one midterm exam for this course. The midterm will be a mix of multiple choice, fill-in-the-blank, short answer, and long answer questions covering topics from lecture and readings.

Final exam (15%): The final will be the same format as the midterm but will cover all material learned during the course. Though cumulative, the majority of the exam will cover material since the midterm exam.

Project (20%): Each student will complete a course project. The course project requires you to make an original map product. High quality work is expected. The topic and type of map is up to you. You will be required to show at least two spatial or temporal variables in the map you produce. That is to say, it is not enough to do a simple choropleth map of one Census statistic. More specific information on the course project will be provided during the semester. There are six parts to the course project: a proposal, a check-in meeting, presentation, final map product, project report, and a set of peer assessments.

Map critiques (12%): On days in which labs are due (besides Labs 1 and 6), a set of students will post their maps on the Blackboard discussion board along with a brief written summary of their map. Another set of students will write a paragraph constructive critique of each map. Each student will choose two times to post maps (each time worth 10 points), and two times to post critiques (each time worth 20 points).

Discussions (12%): There will be six group discussions in this course. Each student will be randomly sorted into a small group at the beginning of the semester for group discussions. Most discussions will require two parts: posting and commenting. Topics will be provided for each discussion. Topics will generally revolve around finding and discussing online resources.

Grading scale:

| <i>Grades</i> | <i>Percentage Required</i> | <i>Grades</i> | <i>Percentage Required</i> | <i>Assignment</i> | <i>Percentage of Total Grade</i> |
|---------------|----------------------------|---------------|----------------------------|-------------------|----------------------------------|
| A+ | 96 to 100 | C+ | 76 to 79.9 | Labs | 33% |
| A | 93 to 95.9 | C | 73 to 75.9 | Midterm | 8% |
| A- | 90 to 92.9 | C- | 70 to 72.9 | Final | 15% |
| B+ | 86 to 89.9 | D | 60 to 69.9 | Project | 20% |
| B | 83 to 85.9 | F | <60 | Map critiques | 12% |
| B- | 80 to 82.9 | | | Discussions | 12% |

Make-up and late assignment policies: Due dates are explicitly stated. Assignments in this course (which are listed above as “Labs”, “Map critiques”, and “Discussions”) will be accepted past the ascribed due date until December 11th. No work will be accepted past that date. Late penalties are assigned in a two-tiered system. Assignments turned in **within seven (7) days will result in a 25% deduction** for the assignment. Assignments **later that seven (7) days will result in a 50% deduction** for the assignment. Technical excuses (“computer system error”, “didn’t submit correctly on Blackboard”, etc.) will not be accepted as reasons for late work. You are expected to start the work early. **Never underestimate the time you will spend on the assignments.** If you cannot complete the assignment on time, it can sometimes be better to turn in partially completed work than nothing at all.

If you are ill or physically indisposed and cannot submit work on time, you must notify the instructor before class for you to have a chance to make up the work. **Special dispensation is available for students with difficulties due to COVID-19 illness or quarantine**; please contact the instructor to make any special accommodations in this regard. **Make-up exams will be given only for University approved excused absences.** This policy may seem strict, but it is in your best interest to turn in everything on time to avoid falling irrecoverably behind. Please contact the instructor if you are struggling and you will receive aid as best as the instructor can provide.

Administrative

Academic integrity: *The following statement is adapted from the Stearns Center for Teaching and Learning.* No grade is important enough to justify academic misconduct. The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code, which you can read fully at the Office for Academic Integrity (<https://oai.gmu.edu/mason-honor-code/>). The Honor Code Pledge reads as follows:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set for this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

The Mason Honor Code defines cheating, plagiarism, stealing, and lying. It is expected that you understand these definitions. If you have any doubts about what constitutes cheating, plagiarism, stealing, or lying in the academic context, please see your professor. **Acts of academic dishonesty in this course may be penalized with failure of either the work in question or the entire course.**

While collaboration and group learning is encouraged in this course, each student **absolutely must** turn in their own work, from their own computer, and any discussion must be theirs alone, and not attributable to another person or group, *except where noted* (for example, quoting authors as a small portion of your scholarly work). This also applies to online sources; you cannot copy the words of anyone else for any graded part of this course. It is not enough to exchange a few synonyms within a sentence! You must write, summarize, and analyze with your own words and ideas.

Course materials and student privacy: All course materials posted to Blackboard or other course sites are private; by federal law, any materials that identify specific students (via their name, voice, or image) **must not be shared** with anyone not enrolled in this class. Video recordings of class meetings that include audio or visual information from other students are private and must not be shared. Live video conference meetings (e.g. Collaborate or Zoom) that include audio or visual information from other students must be viewed privately and not shared with others in your household. **Sharing of instructor-created materials** (lectures, notes, videos, assignments, exams, etc.) to others not currently enrolled in this specific section of this class, **including to public or private online “study” sites, is considered a violation of Mason’s Honor Code.**

Disability statement: This course is in compliance with Mason policies for students with disabilities. Students with disabilities are encouraged to register with Disability Services (DS). DS can be contacted by phone at (703) 993-2474, or in person at SUB I Suite 2500, or online by the link at the end of this section. 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. A memo from DS authorizing your accommodation is needed before any accommodation can be made. The memo should be furnished to the professor preferably within the first two weeks of class or as soon as an accommodation is made. Please visit <https://ds.gmu.edu/> for more information.

Gender identity, pronoun use, and proper address: Students are welcome to share their chosen name and gender pronouns with the instructor and discuss how the instructor can best address you in class and via email. As well, students should be aware that they can use Mason-provided tools to update their chosen name and pronouns; these changes will appear in Blackboard class sites among other places. See <https://registrar.gmu.edu/updating-chosen-name-pronouns/> for more information. Your instructor uses *he/him/his* pronouns. When addressing your instructor in writing or verbally, please use “Dr. Burtch” or “Prof. Burtch.” The surname ‘Burtch’ is pronounced the same as ‘birch.’

Mason diversity statement: From <https://stearnscenter.gmu.edu/professional-development/mason-diversity-statement>

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 have the opportunity to be voiced, heard and respected.

Mason policy on sexual harassment, sexual misconduct, and interpersonal violence: As a faculty member and designated “Responsible Employee,” I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per [university policy 1412](#). If you wish to speak with someone confidentially, please contact the [Student Support and Advocacy Center](#) (703-380-1434), [Counseling and Psychological Services](#) (703-993-2380), [Student Health Services](#), or [Mason’s Title IX Coordinator](#) (703-993-8730; titleix@gmu.edu).

University-wide closures and class cancellations/delays: There may be times during the semester in which George Mason University announces university-wide closures or delays. As an asynchronous online course, in general these cancellations should not delay our course. However, there may be times in which university-wide closures or delays will affect Blackboard availability or the ability to submit coursework. In these situations, your professor will make an announcement via Blackboard and/or email. Check the Mason website and our own Blackboard site for updates. Other cancellations or delays to class will be announced via Blackboard by your professor. In the event that this course is in some way interrupted, the course schedule, assignment deadlines, and other course

alterations will be decided upon and announced via Blackboard and email by the professor. You are expected to stay abreast of any changes.

Instructor availability: Please do not hesitate to contact your instructor if you have questions about course topics or assignments. Your instructor will do his best to answer all weekday emails within 24 hours, and weekend emails within 48 hours. Should you not receive a response within that time frame, you may send a gentle reminder via email. Do try to avoid last-minute emails, as your instructor may not have email accessible immediately before deadlines. It is generally a good practice to avoid sending an email at the first sign of trouble with an assignment; often you will find the proper solution by giving yourself an hour or two to problem solve! Please make use of the office hours listed at the top of this document. Generally, issues can be clarified quickly in person or in a live online chat.

GGG 310 course schedule

| Week | Lecture/Lab Topic | Coursework |
|--------------------------------------|---|--|
| Unit 1: Mapping basics | | |
| Week 1: Aug 24 – Aug 30 | Introduction to cartography 1.1. Course overview 1.2. Cartography and maps 1.3. Types of maps Lab 1: Critiquing maps | Read Chapter 1, 12 Lab 1: - Due Thursday, 9-3 |
| Week 2: Aug 31 – Sep 6 | Cartographic design 2.1. Map elements 2.2. Gestalt principles 2.3. Map outputs Lab 2: Cartography basics | Read Chapter 2 Lab 2: - Due Thursday, 9-10 Discussion 1: - Post due Wednesday, 9-2 - Comments Tuesday, 9-8 |
| Week 3: Sep 7 – Sep 13 | Projections and coordinate systems 3.1. Measuring the Earth 3.2. Projections 3.3. Coordinate systems Lab 3: Projections | Read Chapter 6 Lab 3: - Due Thursday, 9-17 Map critique 1: - Post map Thursday, 9-10 - Comment Monday, 9-14 |
| Unit 2: Symbolization of maps | | |
| Week 4: Sep 14 – Sep 20 | Color and symbolization 4.1. Color and color models 4.2. Color schemes 4.3. Symbolization Lab 4: Color and symbols | Read Chapter 4, 7 Lab 4: - Due Thursday, 9-24 Map critique 2: - Post map Thursday, 9-17 - Comment Monday, 9-21 Discussion 2: - Post due Wednesday, 9-16 - Comments Tuesday, 9-22 |
| Week 5: Sep 21 – Sep 27 | Typography and generalization 5.1. Typography 5.2. Labeling 5.3. Scale 5.4. Generalization Lab 5: Typography | Read Chapter 3, 5 Lab 5: - Due Thursday, 10-1 Map critique 3: - Post map Thursday, 9-24 - Comment Monday, 9-28 |
| Week 6: Sep 28 – Oct 4 | Midterm exam Lab 6: General reference map | Midterm Exam: - Due Friday, 10-2 Lab 6: - Due Thursday, 10-15 Map critique 4: - Post map Thursday, 10-1 - Comment Monday, 10-5 |

| Week | Lecture/Lab Topic | Coursework |
|---|---|--|
| Week 7: Oct 5 – Oct 11 | Terrain visualization 7.1. Terrain file types 7.2. Vertical terrain view 7.3. Other terrain visualizations Lab 6 (continued) | Read Slocum Ch. 20 Project proposal: - Due Friday, 10-9 Discussion 3: - Post due Wednesday, 10-7 - Comments Tuesday, 10-13 |
| Unit 3: Thematic mapping | | |
| Week 8: Oct 12 – Oct 18 | Classification and choropleth mapping 8.1. Data classification 8.2. Choropleth maps 8.3. Dasymetric maps Lab 7: Choropleth maps | Read Chapter 8 Lab 7: - Due Thursday, 10-22 |
| Week 9: Oct 19 – Oct 25 | More quantitative mapping techniques 9.1. Isarithmic maps 9.2. Proportional and graduated symbols maps 9.3. Dot density maps Lab 8: Dot density and graduated symbol maps | Read Campbell Ch. 11 Lab 8: - Due Thursday, 10-29 Map critique 5: - Post map Thursday, 10-22 - Comment Monday, 10-26 Discussion 4: - Post due Wednesday, 10-21 - Comments Tuesday, 10-27 |
| Week 10: Oct 26 – Nov 1 | Additional thematic mapping techniques 10.1. Cartograms 10.2. Flow maps 10.3. Multivariate maps Lab 9: Cartograms | Read Chapter 9, 10 Lab 9: - Due Thursday, 11-5 Map critique 6: - Post map Thursday, 10-29 - Comment Monday, 11-2 |
| Unit 4: Maps, technology, and the Internet | | |
| Week 11: Nov 2 – Nov 8 | Technology and mapping 11.1. Animation 11.2. Multimedia 11.3. GIS 2.0 11.4. Web mapping 11.5. Web languages Lab 10: Web mapping | Read Chapter 11 Lab 10: - Due Thursday, 11-12 Map critique 7: - Post map Thursday, 11-5 - Comment Monday, 11-9 Discussion 5: - Post due Wednesday, 11-4 - Comments Tuesday, 11-10 |
| Week 12: Nov 9 – Nov 15 | Trends and other graphics 12.1. Linked maps 12.2. Using other senses 12.3. Information visualization and spatialization Work on final project | Read Slocum Ch. 26 Map critique 8: - Post map Thursday, 11-12 - Comment Monday, 11-16 |

| Week | Lecture/Lab Topic | Coursework |
|-----------------------------------|---|---|
| Unit 5: The final project | | |
| Week 13: Nov 16 – Nov 22 | Work on final project | Discussion 6: - Post due Wednesday, 11-18 - Comments Tuesday, 11-24 Project check in meeting |
| Thanks-giving | <i>Thanksgiving break – No class</i> | |
| Week 14: Nov 30 – Dec 6 | Final project presentations | Project presentation: - Due Friday, 12-4 Project peer assessments: - Due Monday, 12-7 |
| Finals Week | Final exam and final project completion | Project map and report: - Due Friday, 12-11 Final exam: - Due Friday, 12-11 |

Note: The GGS 310 course schedule is tentative and is subject to revision by the instructor