George Mason University

GGS 310: Cartographic Design

Fall Semester 2025 (August 25 – December 17)

Class meeting: None (Asynchronous)
Class location: canvas.gmu.edu
Sect/Credits: DL1 / 3 credit hours
Teaching assistant: Ethan Hopson
TA email: ehopson2@gmu.edu

Instructor: Nathan Burtch
Email: nburtch@gmu.edu
Instructor office: EXPL 2413
Office hours: F 10:00 AM – 12:00 PM (via Zoom)

General Information

Classmate contact information:

Name	Email	Phone

Catalog description: Focused on the creation and application of maps, with an emphasis on thematic mapping. Includes fundamental mapping principles (projection, scale, generalization, symbolization), spatial data selection and acquisition, and effective design choices for geospatial communication, utilizing mapping software and digital outputs.

Course overview: This course focuses on 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 Pro and other software packages to create maps and graphics. Both lecture and lab will occur asynchronously in video recordings. Lab recordings will give an overview of the assigned lab, but will not guide you through every step to the end. Not every week will have a dedicated 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 scheduled meeting times for this course. 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. Much of the asynchronous material will be presented as videos made by your professor. These materials match those for the professor's in-person version of this course; lecture videos use the same lecture materials, and lab intro videos mimic the intro given in 'live' modalities of this course. There are other asynchronous components, which may include other videos, quizzes, discussions, student presentations, or other assessed work.

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. Note that lecture videos have been created and updated over the course of several years.

Target audience: This course is co-listed at the 300/500 level; it is therefore intended for both undergraduate and graduate students interested in the topic and practice of cartography. GGS 310 is required for GEOG majors (both BS and BA degrees), and is 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:
1. Understand scale, projections, generalization, classification, symbolization, and other basics of cartography
2. Know how to properly place map elements for a balanced layout, creating ethical cartographic products utilizing principles of graphic design
3. Understand how different media (paper, digital, animation) affect map clarity
4. Possess the ability to critique maps
5. Understand and be able to create various thematic maps, and choose which thematic map types are appropriate for certain data or situations
6. Be proficient in cartographic tools of ArcGIS Pro and other software

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: GGS 310 follows the general Mason policy that an undergraduate course can be repeated for grade up to three times. Students enrolling in this course again must submit all newly completed work.

Course Materials

Textbook: This course has one required and one recommended textbook.
Tyner, J. A. 2014. *Principles of map design*. New York: Guilford Press.
ISBN 13: 978-1-462-51712-1

The Tyner textbook is **required** for this course. This textbook is available from various outlets in various forms. It is available through the Mason bookstore or through your online provider of choice. It is also 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 NetID 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&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Search%20Engine&tab=Everything&query=any,contains,tyner%20map%20design&offset=0

Slocum, T., McMaster, R. B., Kessler, F., and Howard, H. 2023. *Thematic cartography and geovisualization*. 4th ed. Boca Raton: CRC Press.
ISBN 13: 978-0-367-71270-9

The Slocum et al. textbook is **recommended** for this course. It is not required that you purchase this textbook. Optional readings from this textbook are listed in the weekly schedule. This text is required in the next cartography class (GGS 411 / 655 Geovisualization) so if you intend to further develop your cartographic skills, this is a recommended addition to your library. This textbook is available from various outlets in various forms. It is available through the Mason bookstore or through your online provider of choice. This is the newest, updated edition of this classic cartographic text.

In addition to these textbooks, there may be other readings posted to Canvas. Students are expected to read before class and be prepared to discuss topics from the readings.

GGS computer lab: The lab in EXPL 2102 is open 24 hours for you to use. Registration in a GGS class should automatically grant you access. Please contact ggsit@gmu.edu to report issues.

Software, hardware, and data: The main software used for this class is ArcGIS; in particular, we will be using ArcGIS Pro. We will also utilize other software in the context of this course, including a graphics editor called Inkscape. Students are able to download a copy of ArcGIS Pro for their own computer (Windows only) through a GMU NetID account. Instructions will be available on Canvas. Inkscape is an open-source software available for various computer operating systems.

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. 64 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 presentations in this class. 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.

It is recommended 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 Canvas at Mason. Course materials such as assignments will be available only in electronic version on Canvas. Students are expected to submit assignments online through Canvas. **Only Word document (.docx or .doc) or Adobe PDF (.pdf) file formats will be accepted**, unless otherwise noted in the assignment. Grades will be posted on Canvas as well. Make sure you are familiar and comfortable with the Canvas interface.

Students are required to have a Mason NetID and associated @gmu.edu email account, which will allow you access to Canvas and lab computers. Please use this university email account when contacting the professor regarding this class; as explained in the Administrative section below, the course professor will not respond to messages sent from a non-Mason email address. Students may also use Microsoft Teams to communicate with the professor, although students should not expect instant responses from these direct chats; in other words, Teams is not a 24/7 direct support line for the class.

Grading

Lab assignments (32%): Most weeks there will be a laboratory exercise. Labs are designed to apply the cartographic theories discussed in class in a hands-on environment. Each lab has graded deliverables, typically in the forms of maps, but also with other documents. Labs will be due on Thursday of the following week (by 11:59 PM). Labs will be submitted online through Canvas, with potentially items due in hard copy. There will be eight (8) labs overall.

Projects (25%): Each student will complete two cartographic projects to make original map products. High quality work is expected. The first project will be mid semester, two weeks in length, and involve the creation of a general reference map. The second will be more of a final course project and is a thematic map of a topic of students' choosing. More specific information on the course projects will be provided during the semester, including their individual weight towards the final grade.

Exams (25%): This course has two exams; a midterm and a final. **The midterm is 10%** of the overall grade, while the **final is 15%**. The midterm will be a mix of multiple choice, fill-in-the-blank, short answer, and long answer questions covering topics from lectures and readings. 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.

Discussions (10%): There will be ten (10) group discussions in this course. 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.

Map critiques (8%): On days when labs are due, a set of students will post their maps on the Canvas 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 twice post maps (each time worth 10 points) and twice post critiques (each time worth 20 points).

Undergraduate grading scale:

Grade	***Percent Required***		
A+	96 to 100	**C+**	76 to 79.9
A	93 to 95.9	**C**	73 to 75.9
A-	90 to 92.9	**C-**	70 to 72.9
B+	86 to 89.9	**D**	60 to 69.9
B	83 to 85.9	**F**	<60
B-	80 to 82.9		

Assignment	***Percentage of Total Grade***
Labs (8)	**32%**
Projects	**25%**
Final exam	**15%**
Midterm exam	**10%**
Discussions (10)	**10%**
Map critiques	**8%**

Make-up and late assignment policies: Due dates are explicitly stated. All assessed/graded items in this course will be accepted past the ascribed due date until **December 12th**. Late penalties are assigned in a two-tiered system. Items turned in **within seven (7) days** will result in a **10% deduction**. Items **later than seven (7) days** will result in a **25% deduction**. This penalty begins 1 minute after the due date. Technical excuses ("computer system error", "didn't submit correctly on Canvas", etc.) will not be accepted as reasons for late work. You are expected to start work early. **Never underestimate the time you will spend on the assignments.**

If you are ill or physically indisposed and cannot submit work on time, you must notify the instructor beforehand for you to have a chance to make up the work without late penalty. 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.

Incomplete policy: Students may request an incomplete for this course if they (a) currently have a 75% grade based on submitted coursework and relative weighting; (b) have completed at least 50% of coursework materials; (c) cannot complete scheduled coursework for a cause beyond reasonable control; and (d) submit an Incomplete Grade Contract with the professor. In general, students have until the 9th week of the following full semester to complete their work (unless it is the student's final semester). All incomplete work will be assigned **late penalties as outlined** in this syllabus.

Administrative

Academic standards: *The following statement is part of the "Common Policies Addendum" required by the University by AP.2.5; the wording is provided by the Stearns Center for Teaching and Learning as of 5-19-2025 at https://stearnscenter.gmu.edu/home/gmu-common-course-policies/.*

Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

- **Honesty:** Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- **Acknowledgement:** Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, co-authored pieces, and project reports.
- **Uniqueness of Work:** Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments,

code, presentations, exams, and all other forms of academic work.

Violations of these standards — including but not limited to plagiarism, fabrication, and cheating — are taken seriously and will be addressed in accordance with university policies. The process for reporting, investigating, and adjudicating violations is outlined in the university's procedures. Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

Accommodations for students with disabilities: *The following statement is part of the "Common Policies Addendum" required by the University by AP.2.5; the wording is provided by the Stearns Center for Teaching and Learning as of 5-19-2025 at https://stearnscenter.gmu.edu/home/gmu-common-course-policies/.*

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. 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, please visit https://ds.gmu.edu/ for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu. Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor *in advance* of any relevant class meeting, assignment, or exam.

FERPA and use of GMU email addresses for course communication: *The following statement is part of the "Common Policies Addendum" required by the University by AP.2.5; the wording is provided by the Stearns Center for Teaching and Learning as of 5-19-2025 at https://stearnscenter.gmu.edu/home/gmu-common-course-policies/.*

The Family Educational Rights and Privacy Act (FERPA) governs the disclosure of education records for eligible students and is an essential aspect of any course. **Students must use their GMU email account** to receive important University information, including communications related to this class. Instructors will not respond to messages sent from or send messages regarding course content to a non-GMU email address.

Student responsibility: Students are responsible for checking their GMU email regularly for course-related information, and/or ensuring that GMU email messages are forwarded to an account they do check.

Title IX resources and required reporting: *The following statement is part of the "Common Policies Addendum" required by the University by AP.2.5; the wording is provided by the Stearns Center for Teaching and Learning as of 5-19-2025 at https://stearnscenter.gmu.edu/home/gmu-common-course-policies/.*

As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, **all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct** (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please see University Policy 1202: Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence. Questions regarding Title IX can be directed to the Title IX Coordinator via email to TitleIX@gmu.edu, by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

Student opportunity: If you prefer to speak to someone **confidentially**, please contact one of Mason's confidential employees in Student Support and Advocacy (SSAC), Counseling and Psychological Services (CAPS), Student Health Services (SHS), and/or the Office of the University Ombudsperson.

Academic and religious calendars: The Registrar establishes academic calendars in advance of every academic semester or term. You can view the Fall 2025 academic calendar for details. Some important dates include:

- First day of class — August 25
- Labor Day (University closed) — September 1
- Last day to drop course with 100% refund — September 8
- Last day of unrestricted withdrawal — September 30
- Fall Break (No classes) — October 13
- Last day of selective withdrawal — October 27
- Election Day (No classes) — November 4
- Thanksgiving Recess (University closed) — November 26 – 30
- Last day of class — December 8
- Last day of examination period — December 17

Mason also maintains a calendar of religious holidays. Students will receive reasonable accommodations so that they can observe religious holidays. Students must contact the professor prior to any planned observance in order to create reasonable accommodations. In general, work that is due on a date of a religious holiday is expected to be completed prior to the deadline.

Course materials and student privacy: All course materials posted to Canvas 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. Some of our synchronous meetings in this class may be recorded to provide necessary information for students in this class. Recordings will be stored on Canvas and will only be accessible to students taking this course during this semester. **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 Academic Standards.**

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 Canvas class sites among other places. 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 the genus of trees called 'birch.'

Individual work, collaboration, and generative-AI: This is additional guidance to the Academic Standards portion above. At times, you may want to work with other students in this course towards completing homework or otherwise studying. This is good; there are likely times where student learning is enhanced through collaboration. There is even a spot in the top of this syllabus where you can jot down contact information for some classmates! 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 written 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.

A new technology, generative-AI models, requires an additional statement. **Student use of generative-AI models or tools must conform to Mason Academic Standards.** This means that students are expected, as outlined above, to turn in their own work, in their own words. Using generative-AI models to submit written documents, answers to assignment/test questions, or otherwise passing AI-generated text as your own work **does not conform to academic standards**. The **only exception** is that students are permitted to generate AI-produced imagery included in submitted materials if it enhances the submitted product; for example, a custom icon or logo on a map. Students are permitted to use generative-AI for this class in non-assessed activities; summarizing content and brainstorming are examples of those cases.

In short, your professor will not use generative-AI to grade/assess your work, and you will not use generative-AI to produce your work.

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.

Non-discrimination and inclusive classrooms: George Mason University, in addition to adhering to state and federal regulations against discrimination, has created our own non-discrimination policy. This policy is to allow all students, faculty, and staff to work or learn in an "environment free from any discrimination on the basis of race, color, religion, ethnic national origin (including shared ancestry and/or ethnic characteristics), sex, disability, military status (including veteran status), sexual orientation, gender identity, gender expression, age, marital status, pregnancy status, genetic information, or any other characteristic protected by law." If you face discrimination, or know that discrimination has occurred in our Mason community, you can submit details of the incident to the Office of Access, Compliance, and Community. Within our classroom, we are committed to the value of inclusive excellence at Mason, which values each of our individualities and provides opportunities to consider and learn about different perspectives than our own. Our classroom extends to any digital spaces we use; students are expected to respect others in online discussion boards, synchronous online meetings, and any other virtual spaces of class contact. You are expected to use **netiquette** in those spaces and practice the core principles of being a **digital citizen**; respect, educate, and protect.

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. Should inclement weather or another emergency force Mason to close, causing our class to cancel meeting times, we will not meet. Courses without meeting (asynchronous) may also be affected. Check the Mason website and our own Canvas site for updates. Other cancellations or delays to class will be **announced via Canvas** by your professor. In the event that this course has missed meeting times, the course schedule, assignment deadlines, and other course alterations will be decided upon and announced via Canvas and email by the professor. You are expected to stay abreast of any changes.

Use of electronic devices: Your professor **encourages the use of devices** that both aid your learning ability and do not distract from the learning of others. Except for mobile phones and audio/video recorders, you are free to use any electronic device that fulfills both of those conditions. All electronic devices should be muted or silenced. Please be respectful of the class and avoid use of social media during class which can distract both you and your classmates. You are expected to adhere to Mason's student code of conduct; disruptive behavior will result in classroom removal. Audio/video recording requires the consent of the professor. This policy pertains to any in-person aspect of the course.

GGS 310 course schedule

Week	Lecture/Lab Topic	Coursework
Unit 1: Mapping basics		
Week 0 Aug 25 – Aug 31	Introduction to cartographic design 0.1. Course logistics 0.2. Cartography and maps 0.3. Types of maps 0.4. Mapping data 0.5. Digital spatial data 0.6. Data quality and location	**Read** Tyner Ch 1; Slocum Ch 1; Anthamatten Ch 10, 11
Week 1 Sep 1 – Sep 7	Map design & critique 1.1. Gestalt principles 1.2. Map elements 1.3. Map design 1.4. Map outputs 1.5. Map critique	**Read** Tyner Ch 2, 12; Slocum Ch 11, 13 **Discussion 1:** - Post Thursday, 9-4 - Comment Sunday, 9-7
Week 2 Sep 8 – Sep 14	Symbolization 2.1. The language of maps 2.2. Visual variables 2.3. Additional symbol categories Lab 1: Cartographic design basics	**Read** Tyner Ch 7; Slocum Ch 4 **Discussion 2:** - Post Thursday, 9-11 - Comment Sunday, 9-14
Week 3 Sep 15 – Sep 21	Projections and coordinate systems 3.1. Measuring the Earth 3.2. Coordinate systems 3.3. Projections 3.4. Categories of projections 3.5. Planar coordinate systems 3.6. Choosing a projection Lab 2: Projections	**Read** Tyner Ch 6, Appendix A; Slocum Ch 7, 8, 9 **Lab 1:** - Due Thursday, 9-18 **Map critique 1:** - Comment Sunday, 9-21 **Discussion 3:** - Post Thursday, 9-18 - Comment Sunday, 9-21
Unit 2: Major design components of maps		
Week 4 Sep 22 – Sep 28	Color 4.1. The nature of color 4.2. Color models 4.3. Color schemes 4.4. Using color 4.5. Issues with color Lab 3: Color	**Read** Tyner Ch 4; Slocum Ch 10 **Lab 2:** - Due Thursday, 9-25 **Map critique 2:** - Comment Sunday, 9-28 **Discussion 4:** - Post Thursday, 9-25 - Comment Sunday, 9-28
Week 5 Sep 29 – Oct 5	Typography 5.1. Text on maps 5.2. Typography 5.3. Labeling Lab 4: Typography	**Read** Tyner Ch 3; Slocum Ch 12 **Lab 3:** - Due Thursday, 10-2 **Map critique 3:** - Comment Sunday, 10-5 **Discussion 5:** - Post Thursday, 10-2 - Comment Sunday, 10-5

Week	Lecture/Lab Topic	Coursework
Week 6 Oct 6 – Oct 12	Scale and generalization 6.1. Map scale 6.2. Cartographic generalization **Midterm exam (Oct 12)** Project 1: General reference map	**Read** Tyner Ch 5; Slocum Ch 6 **Lab 4:** - Due Thursday, 10-9 **Map critique 4:** - Comment Sunday, 10-12
Week 7 Oct 13 – Oct 19	Terrain visualization 7.1. Terrain display 7.2. Vertical terrain view 7.3. Other terrain visualizations Project 1 work	**Read** Slocum Ch 23 **Project 2** proposal: - Due Thursday, 10-16
Unit 3: Thematic mapping and map use		
Week 8 Oct 20 – Oct 26	Thematic mapping I 8.1 Statistical data 8.2 Data classification 8.3 Choropleth maps 8.4 Chorochromatic maps Lab 5: Choropleth maps	**Read** Tyner Ch 8; Slocum Ch 3, 5, 15 **Project 1** final map: - Due Thursday, 10-23 **Discussion 6:** - Post Thursday, 10-23 - Comment Sunday, 10-26
Week 9 Oct 27 – Nov 2	Thematic mapping II 9.1. Isarithmic maps 9.2. Heat maps 9.3. Proportional and graduated symbols map 9.4. Dot and dot density maps Lab 6: Dot density and graduated symbol maps	**Read** Tyner Ch 8; Slocum Ch 17, 18, 19 **Lab 5:** - Due Thursday, 10-30 **Map critique 5:** - Comment Sunday, 11-2 **Discussion 7:** - Post Thursday, 10-30 - Comment Sunday, 11-2
Week 10 Nov 3 – Nov 9	Thematic mapping III 10.1. Dasymetric maps 10.2. Cartograms 10.3. Flow maps 10.4. Bivariate and multivariate maps Lab 7: Dasymetric and flow maps	**Read** Tyner Ch 9, 10; Slocum Ch 16, 20, 21, 22 **Lab 6:** - Due Thursday, 11-6 **Map critique 6:** - Comment Sunday, 11-9 **Discussion 8:** - Post Thursday, 11-6 - Comment Sunday, 11-9
Week 11 Nov 10 – Nov 16	Cartographic history and map use 11.1. History of cartography 11.2. Modern cartography 11.3. Map use 11.4. Maps of persuasion 11.5. The cartographic octopus Lab 8: Cartograms	**Read** Slocum Ch 2; Tyner Ch. 32 (PDF) **Lab 7:** - Due Thursday, 11-13 **Map critique 7:** - Comment Sunday, 11-16 **Discussion 9:** - Post Thursday, 11-13 - Comment Sunday, 11-16

Week	Lecture/Lab Topic	Coursework
Week 12 Nov 17 – Nov 23	Data visualization, trends, and other graphics 12.1. Data visualization 12.2. Linked maps 12.3. Information visualization and spatialization 12.4. Using other senses 12.5. Mapping uncertainty 12.6. Virtual and augmented environments Project 2: Thematic map	**Read** Tyner Ch 11; Slocum Ch 25, 27, 28 **Lab 8:** - Due Thursday, 11-20 **Map critique 8:** - Comment Sunday, 11-23 **Discussion 10:** - Post Thursday, 11-20 - Comment Sunday, 11-23
Unit 4: The final project		
Thanks-giving	*Thanksgiving Break – No material this week*	
Week 13 Dec 1 – Dec 7	Project 2 work One-on-one check-in with Professor	**Project 2** check-in meeting
Finals Week Dec 8 – Dec 14	**Final exam (Dec 14)** Project 2 presentations	**Project 2** presentation, map, and report: - Due Thursday, 12-11 **Project 2** peer assessments: - Due Sunday, 12-14

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