George Mason University

GGS 411: Advanced Digital Cartography

Spring Semester 2019 (Jan 22 – May 15)

Hours: Mo 1:30 PM – 4:10 PM
Location: EXPL 2103
Website: https://mymason.gmu.edu
Sect/Credits: 001 / 3 credit hours

Instructor: Nathan Burtch
Email: nburtch@gmu.edu
Instructor office: EXPL 2413
Office hours: TuWe 3:00 – 4:45 PM

General Information

Classmate contact information:

Name	Email	Phone

Catalog description: This advanced course in cartography focuses on thematic map design. The objective is to produce a cartographic portfolio of well-designed, professional grade maps. Theoretical concepts and principles will be introduced using practical examples and written assignments.

Course overview: This course builds on the concepts learned in GGS 310 through utilizing cartographic principles with different software to create advanced geovisualizations. Students will explore different mapping platforms and geovisualization techniques, creating complex static cartographic products, animation, and dynamic web maps. At least one of the projects will require R programming, but no prior experience in R is necessary.

GGS 411 is designed as a project-based learning (PBL) environment. Project-based learning is an active learning pedagogy in which students work on projects that involve real-world problems or situations. Multiple times through the semester, students will need to devise a research question, create or acquire data, develop a cartographic methodology, and complete a report and presentation. Through this method, students will develop skills in problem solving, critical thinking, creativity, and both written and oral communication. Rather than utilizing labs or assignments that have step-by-step instructions, for the vast majority of the projects students must engage the questions and software directly and develop their skills. In many ways, this method of course delivery is intended to reflect the challenges students will soon see (or are currently seeing) in the modern geoinformational work force, where you will need to create meaningful end products but chances are unlikely that detailed step-by-step instructions will be given.

Choose a project topic: Students will develop all of the cartographic projects based on the same topic. Students will develop their individual topical ideas early in the semester. Topics should be more specific than general; for example, the topic of 'sports' is too general, whereas 'professional sports stadiums' is a better topic, and 'economics of professional sports stadiums' is likely even better. Each of the cartographic projects (map reports) will be based on the same topic, but will use varied scales, methods, visualizations, and data to create unique products.

Target audience: This course serves as an advanced techniques elective for the GEOG BS and the GIS minor. It can also serve as an upper level elective for the GEOG BA or minor. This course is appropriate for any student that has completed GGS 310 and wants to develop further cartographic skills.

Applicable learning outcomes: Successful completion of this course will enable students to:

1. Develop quality research questions and associated cartographic methods to answer the questions
2. Independently develop and manage high-quality projects
3. Communicate constructive criticism in order to improve the projects of each individual in the class
4. Think critically and creatively about how to best visualize patterns and relationships.

Prerequisites: It is required that students complete GGS 310 with a minimum grade of C. It is recommended that students complete GGS 311 prior to enrolling in this course.

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 texts:

Tyner, J. A. 2010. *Principles of map design*. New York: Guilford Press.

Krygier, J., and D. Wood. 2016. *Making maps: A visual guide to map design for GIS*. 3rd ed. New York: Guilford Press.

Both of these books are available freely online through the GMU library. You will need to use your Mason email account to log in for access. Below are links to each 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. It appears you can also get a PDF copy of both.

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

To access the Krygier and Wood text, use the following link: https://wrlc-gm.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma9943190783404105&context=L&vid=01WRLC_GML:01WRLC_GML&search_scope=MyInst_and_CI&isFrbr=true&tab=Everything&lang=en

In addition to these texts, other readings will be posted to Blackboard. Students are expected to read before class and be prepared to discuss topics from the readings.

Software, hardware, and data: This course will utilize multiple pieces of software. Among these software will be ArcGIS, Adobe Creative Cloud, and R. Most of you have likely used ArcGIS and are at least familiar with some of the software Adobe provides. R is the open source, freeware version of Splus, one of the most powerful and versatile statistical packages, and is available for free download for use on PC, Mac, UNIX and Linux environments.

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. You can also make use of the GMU Virtual Computing Lab (https://www.vcl.gmu.edu/).

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. Cloud storage is another option, either to keep all your files or to use as a common backup. We will likely also utilize some web space for project files; details will come during the semester.

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 for your written reports,** with some file type exceptions for cartographic products. 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.

Grading

Map reports (40%): Over the course of the semester students will complete four (4) small cartographic projects. These projects are designed to allow students to explore different types of geovisualization and different tools for crafting well designed end products. Along with a finalized cartographic project, students will submit a written report detailing the questions asked, methods, design process, and answers derived from the cartographic project. Details for each of these projects and expectations for reports will be posted on Blackboard.

Final Story Map (15%): The cartographic projects completed during the semester will culminate with a final project using the Esri Story Map application. Using Story Maps, students will combine text, cartography, and multimedia from the prior four project, plus additional contextual analysis, to design a high quality web-based cartographic experience. Each student will present their Story Map to the class during the final exam period for the course. Details will be posted later in the semester on Blackboard.

Presentations (15%): At the time when each of the map reports are due, approximately half of the students in the class will present their maps. The purpose is two-fold; students will be able to see products that their peers are creating (thus getting ideas for improving their own maps), and students will receive critical feedback for their own work. Each presentation will be brief; students

will display their work and describe their rationale and cartographic choices. Students will be randomly assigned their two presentations. Part of the presentation grade will also be composed of completing evaluations of three of your classmates' maps.

Final Exam (20%): The final exam will use essay-based questions regarding topics from assigned readings and discussions in class to assess knowledge of course topics. The final exam will be administered during the first half of the last regularly scheduled class. Please see the course calendar at the end of this syllabus for more logistic information.

Participation (10%): In class discussions are an importation part of this course. Students are expected to discuss readings and concepts with the class. In addition, students can participate by telling the class about best practices in working on their map reports. Students will earn 1 participation point for each quality, pertinent contribution, with a maximum of 2 points that can be earned in a day. There are 13 class sessions in which discussions/questions can occur, so a maximum of 26 points can be earned. 20 points will be the initial point set that represents 100% for this category. This means that students are not required to participate every day, but rather just most days. The professor may choose to lower the 100% threshold depending on the direction of the semester.

Grading scale:

Grades	***Percentage Required***	***Grades***	***Percentage Required***	***Assignment***	***Percentage of Total Grade***
A+	96 to 100	**C+**	76 to 79.9	Map reports (4)	**40%**
A	93 to 95.9	**C**	73 to 75.9	Final StoryMap	**15%**
A-	90 to 92.9	**C-**	70 to 72.9	Presentations	**15%**
B+	86 to 89.9	**D**	60 to 69.9	Final Exam	**20%**
B	83 to 85.9	**F**	<60	Participation	**10%**
B-	80 to 82.9				

Note on attendance: Regular attendance is an expectation. Those that make a habit of missing class tend to do worse in this course than those that do attend. It is in your best interest to come to class and participate as attendance will lead to a better understanding of course concepts. Students are responsible for any announcement given by the instructor during class regardless of their personal attendance.

Students that must miss classes because of religious observances or participation in University activities should provide documentation to the professor within the first two weeks of the course. Reasonable accommodations will be provided for work missed on those days. It is expected that if a student is to have one of these excused absences on a day in which an assignment is due that the student submit the assignment early.

Make-up and late assignment policies: Assignment due dates are explicitly stated. **Assignments that are not turned in by the due date will result in a 50% deduction for the assignment.** This penalty begins 1 minute after the due date! Assignments will be accepted up to the final regular class meeting of the semester (May 6th). 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 are ill or physically indisposed and cannot submit your assignment on time, you must notify the instructor before class for you to have a chance to make up the assignment. 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. If you cannot complete the assignment on time, it can sometimes be better to turn in partially completed work than nothing at all.

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.

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.

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; cde@gmu.edu).

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. With the exception of 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.

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. 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 has missed meeting times, 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; many times you will find the proper solution by giving yourself an hour or two to problem solve!

Please also make use of the office hours listed at the top of this document. Generally, issues can be clarified quickly in person.

GGS 411 Course Schedule

Dates		Lecture Topics	Reading	Due
Week 1	Jan 21	*Martin Luther King Jr. Day – no class*		
Week 2	Jan 28	Course introduction & map topic discussion / Infographics	Campbell Ch. 15 Thompson Tufte; Tufte Ch. 5	
Week 3	Feb 4	Cartographic design and critique	Krygier & Wood Ch. 6, 7 Mattern Tyner Ch. 1, 2, 12	
Week 4	Feb 11	Map presentations / Thematic mapping	Campbell Ch. 11 Krygier & Wood Ch. 8 Tyner Ch. 8, 10	Info-graphic
Week 5	Feb 18	Multivariate mapping	Slocum et al. Ch. 24 Tufte Ch. 5 Tyner Ch. 9	
Week 6	Feb 25	Color, symbol, and typography	Krygier & Wood Ch. 9, 10, 11, 12 Tyner Ch. 3, 4, 7	
Week 7	Mar 4	Map presentations / Animated cartography	Peterson Ch. 7 Peterson Tyner Ch. 11	Multi-variate
Week 8	Mar 11	*Spring Break – no class*		
Week 9	Mar 18	3D cartography	Harder & Brown Ch. 6 Petrovic	
Week 10	Mar 25	Guest speaker		
Week 11	Apr 1	Map presentations / Web mapping	Slocum et al. Ch. 24	Ani-mation
Week 12	Apr 8	Working with R	Introduction to R Ch. 1, 2 Leaflet for R	
Week 13	Apr 15	Mapping ethics and propaganda	Campbell Ch. 16 Krygier & Wood Ch. 1 Monmonier Ch. 7	
Week 14	Apr 22	Map presentations / Esri Story Maps	Harder & Brown Ch. 3	Web Map
Week 15	Apr 29	Fantasy cartography	Harmon Padron	
Week 16	May 6	Final exam / Project work time		
Finals Week	May 13	Story Map presentations: Monday, May 13, 1:30 – 4:15 PM		Final StoryMap

Note: The GGS 411 course schedule is tentative and is subject to revision by the instructor