

THEMATIC CARTOGRAPHY AND GEOGRAPHIC VISUALIZATION

(GIS5131||Spring 2022)

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Class Hours: Mondays: 2:30 – 5:00 p.m.; Bellamy 035

Office Hours: Fridays: 12:00 – 2:00 p.m.; largely through Zoom but in-person meetings possible upon request

Teaching Assistant: N/A

Computing Lab Manager (any problem related to computer system): Shawn Lewers (slewers@fsu.edu)

Course Description and Objectives

Maps are important communication and decision support tools. The purpose of many GIS-related projects is to produce maps, and many consumers of geographic information only interact with GIS through the use of map products. The skills of map production according to established cartographic conventions are, therefore, essential to managers, technicians, and scientists.

This course examines the design and implementation of effective visualization of geographic data, phenomena, patterns, and processes. It trains students the skills in creating professional-quality maps and other visual products that are used as a communication product or for data exploration. Students will have a deeper understanding of the theoretical basis that is formed by cartography, visual perception, and communication models. This course is to stimulate students' design sensibilities and train students' critical eye for good design in maps and other visual forms.

The course consists of lectures, computer-based map design exercises, and map reviews. The lecture focuses on cartographic principles, mapping techniques, and visualization methods (such as animation, interactive data exploration, web mapping, and virtual reality). A substantial component of this course is comprised of sequential map design and production exercises that involve the use of a leading commercial GIS software package.

Prerequisite

Currently, there is no prerequisite listed for this course. However, a basic understanding of the mapping science and a comfortable use of computer are essential for this course.

Computing Environment, Software and GIS Lab Policies

Windows-based ArcGIS (and some extensions) will be used for class assignments. *However, you must be aware that this is not a software training course.* If you are looking for a specific software training course, you should visit the homepage for that software package. The vendor may provide short training courses or some software-specific training materials.

You should read and observe the following policies when using our GIS lab facilities.

Typically, you will be given a temporary account in order to log on a computer in COSS GIS Lab. This account may expire by the end of the semester. When you are at the computer lab, you must observe the COSS GIS lab and FSU's related policies. The GIS lab rules include:

- No food or drink in the lab.
- Lab computers are for GIS work only. Your other class work is to be done in other labs.

- Lab printers (if any) are for GIS work only.
- DO NOT install software without permission from your instructor or the lab manager. If you need software, ask!
- DO NOT save your work on the local machines. Use your Z:\ drive. If you use the local machine or temp directory, others will be able to see your work and it may not be there later.
- DO NOT waste color prints (if any), as they are expensive. Use the black and white printer whenever possible.
- Be courteous of others in the lab and stay quiet.
- Clean up after yourself. Lab attendants will throw out things that are left behind.
- DO NOT remove equipment that belongs in the lab from the lab. You will be criminally prosecuted if you are caught.
- DO NOT download MP3 or movie files. Most of these websites are compromised by viruses.
- Always log-off the computers when you are done, but DO Not shut them down.
- No instant messaging is allowed.
- Follow the FSU Honor Code and Code of Conduct rules and behave in an adult-like manner.

It is your responsibility to check and observe these rules. Any violation of these rules can result in the loss of privileges to use this facility. If that happens, it is your responsibility to find an alternative so that you could work on your lab assignments. If you are unsure about a rule or rules, ask a lab employee or Shawn Lewers (slewers@fsu.edu).

Course CANVAS Site

CANVAS will be used to host the course lecture and lab materials. You may find my lecture slides there, but there is no guarantee that these lecture materials will be available on time. You will still need to take notes during a lecture session. You are expected to check that site from time to time because some important announcements may be posted there. The CANVAS address is: <https://canvas.fsu.edu>. You will need to use your FSU account username and password to access this site.

I will also post your grades of the class assignments on the canvas site. Note that these are your unweighted raw scores. You can calculate your final grade (in percentage) based on a weighting system discussed in the next section of this syllabus. Please do not hesitate to contact the course instructor should you have any questions for this.

For copyright reason please do not distribute anything posted on the CANVAS site to a third person.

Grading Policies

Grading System

A	93-100	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
B	83-86	C-	70-72	F	59-0

In qualitative terms, the grade standards are **A**, Outstanding, few errors or omissions (if any); **B**, Good, only minor errors/omissions; **C**, Satisfactory, at least one major error/omission; **D**, Poor, several major errors/omissions; and **F**, Fail: many major errors/omissions.

Grading Components

Components	Description	Weights
Lab assignments	There are several lab assignments to be completed within a fixed time frame	30%
Map reviews and critiques	Critical reviews of maps and other visual products	15%
Open-book exam (Writing assignment)	A set of questions to be answered within a fixed time period	30%
Term paper and presentation	An applied mapping project or a thematic review	25%

Course Attendance

Students are required to attend all classes and be punctual. Missing even one lecture can affect your grade substantially. Announcements regarding the course structure and the change of schedule for lectures, labs, and writing assignments may be made in class. All organizational/administrative announcements made during the class period are assumed to be known by all students.

Attendance will be regularly checked. If you are not able to attend a class meeting, you will need to contact the instructor with an excuse provided. Usually, a substantial excuse should be provided for the second time when you miss a class meeting. A 10% of the total grade reduction will be applied for each unexcused absence. Being late or leaving earlier twice will be counted as ONE unexcused absence.

If you have to miss the class meeting during a writing assignment day or during a map/media review and discussion session, you will have to provide an acceptable excuse (before I can reschedule your work).

The list of acceptable excuses includes documented illness, deaths in the immediate family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. Considerations will also be given to students whose dependent children experience serious illness. Most other excuses for missing an exam may NOT be acceptable.

Cell phones, pagers, alarms, laptops, calculators, and other electronic devices must always be turned off in class.

Writing Assignments

The writing assignment can involve any material covered in lectures, reading or discussion assignments, and labs. There is no provision for extra credit work. A make-up writing assignment could be arranged only when you present an acceptable excuse (check the course attendance section for a list). Most other excuses for missing this assignment are NOT acceptable. This policy will be strictly enforced.

Assignment Grading Policies

Grades of your lab exercises and other assignments (e.g., map review reports) are based on the quality of your answers. Any answer should be concise and be well organized. The grade for each assignment is reported as *points_scored /total_points_of_exercise*. For example, if an assignment is worth 20 points and your answers score 16 points, then you should receive 16/20 for the grade.

Each assignment will have a due day (normally 11:59 pm of that day). Any assignment that is turned in after the due time on the due day is considered late, which will receive penalty.

The penalty for a late assignment is based on the number of days late (including weekends). If an assignment is late less than 24 hours, it is considered 1 day late. If an assignment is late less than 48 hours but more than 24 hours, it is considered 2 days late, and so on. Late assignments are penalized **20%** per day. Here is the formula for calculating the points of a late assignment:

$$\text{Points}_{\text{get}} = \text{Points}_{\text{scored}} - 0.20 * \text{num}_{\text{days}_{\text{late}}} * \text{Points}_{\text{scored}}$$

The minimum value of Points_{get} is 0. *Assignments handed in after I have returned the graded assignment to class (usually one week after the due date) will receive no points.* Again, you must provide acceptable excuse (see exam section) in order to receive more time for you to complete lab exercises without penalty applied. You should discuss with your lab instructor about your situation no later than the due day. This policy will be applied stickily.

Note that every person must hand in his or her own lab assignments. Working together is permitted and encouraged, BUT each person will be graded separately, must answer "creative response" questions independently, and must create his or her OWN maps. Turning in identical or substantially similar assignments will result in significant grade reduction.

Map Reviews and Critiques

A set of maps or other visual products will be provided or identified, which will be reviewed critically using cartographic design principles you will learn from this course. A review report for each map or other visual product is needed. More details will be discussed in the class.

Term Papers

This component will be discussed in a separate document.

Course Materials

Required Text

- **Slocum, T., McMaster, R. B., Kessler, F. C., and Howard, H. H., 2009. *Thematic Cartography and Geographic Visualization* (3rd). Upper Saddle River, NJ: Prentice Hall. 561p (You will need to bring this book in all lecture sessions)**

In addition to the above required text, a few selected chapters from the following books or other journals might be used as supplemental reading assignments:

- Anthamatten, P. 2021. *How to Make Maps: An Introduction to Theory and Practice of Cartography*. Routledge.
- Brewer, C. A. 2015. *Designing Better Maps: A Guide for GIS Users* (2nd). ESRI Press.
- Clarke, K., 2015. *Maps & Web Mapping Plus MyGeosciencePlace with Pearson eText -- Access Card Package*. Prentice Hall.
- Crampton, J. W. 2010. *Mapping: A Critical Introduction to Cartography and GIS*. Wiley-Blackwell.
- Dent, B., Torguson, J., and Hodler, T. 2008. *Cartography: Thematic Map Design* (6th). Boston: The McGraw-Hill Companies.
- Dodge, M., DcDerby, M., and Turner, M. (eds.). 2009. *Geographic Visualization: Concepts, Tools & Applications*. Chichester: Wiley-Blackwel.
- Field, K. 2015. *Cartography*. ESRI Press.
- Kraak, M.J. and Ormeling, F. 2020. *Cartography: Visualization of Geospatial Data* (4th). CRC Press.
- Monmonier, M., 1993. *Mapping it out*. Chicago: The University of Chicago Press.
- Peterson, G. N., 2014. *GIS Cartography: A Guide to Effective Map Design* (2nd). CRC Press.

- Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., and Guptill, S. C., 1995. *Elements of Cartography* (6th). New York: John Wiley and Sons.

Cartographic/Geovisualization Journals

- *Cartography and Geographic Information Science* (the cartography journal published by Taylor & Francis for CAGIS; more emphasizing GIS use in cartography).
- *Cartographica* (the international journal for geographic information and geovisualization).
- *The Cartographic Journal* (published by Taylor & Francis on behalf of The British Cartographic Society-BCS)
- *International Journal of Cartography* (published by Taylor & Francis on behalf of the International Cartographic Association-ICA).

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy>)

PLAGIARISM: All submitted assignments must be your own original, independent work. All sources must be properly cited (especially in the graduate student paper). Ask the instructor if you are unsure what to do. Plagiarism will result in significant grade reduction.

Academic Success

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

Americans With Disabilities Act

Florida State University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

To receive academic accommodations, a student: (1) must register with and provide documentation to the Office of Accessibility Services (OAS); (2) must provide a letter from OAS to the instructor indicating the need for accommodation and what type; and (3) should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor. This should be done during the first week of class.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the

Office of Accessibility Services
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
850- 644-9566 (voice)
850-644-8504 (TDD)
oas@fsu.edu
<https://dsst.fsu.edu/oas>

Confidential campus resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program
University Center A, Rm. 4100
(850) 644-7161
Available 24/7/365
Office Hours: M-F 8-5
<https://dsst.fsu.edu/vap>

Counseling and Psychological
Services
Askew Student Life Center, 2nd
floor
942 Learning Way
(850) 644-8255
<https://counseling.fsu.edu/>

University Health Services
Health and Wellness Center
(850) 644-6230
<https://uhs.fsu.edu/>

Free Tutoring from FSU

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. The instructor reserves the right to change the content of the syllabus or course material during the course of the semester. Any changes will be posted in the announcement section on Canvas or be notified through emails. Students should check announcements and your FSU email account timely.

Statement On Public Health Protocols (Approved by FSU Faculty Senate in Fall 2021)

In our classroom, I will expect everyone to wear a proper, well-fitting mask. As our President has informed the university community, FSU expects everyone on campus to use face-coverings. In regions where virus rates are high, the CDC recommends that even vaccinated individuals wear masks in public indoor spaces, like classrooms, especially where social distancing is not possible. Florida infection and hospitalization rates are greater now than they were at the height of the 2020 surge due to the Delta variant, a more infectious and easily transmissible version of the COVID-19 virus. The best way to protect against serious illness is to be fully vaccinated, but not everyone among us can be. Because the Delta variant can infect even vaccinated individuals and can be spread by them to others, it poses a special threat to members of the community with underlying health conditions and children at home who are too young for vaccination.

For these reasons, FSU expects each member of the community to comply with the public health protocols our President set forth on August 9, 2020, including *(1) wearing masks in public indoor spaces, (2) getting fully vaccinated, (3) being tested for the virus if you have symptoms, and (4) staying home and away from others if you are sick.* Please remember that you should NOT attend class in person if you have tested positive for COVID-19 or are quarantining after exposure. Finally, please bear in mind that the COVID-19 situation is fast moving and that university guidance on the issue may change at any time.

Statement for Classes Subject to HB233 Recording (Approved by FSU Faculty Senate in Fall 2021)

In this class, consistent with state law and university policy, students are permitted to make recordings of class lectures for personal use only. As noted, sharing, posting, or publishing classroom recordings may subject you to honor code violations and legal penalties associated with theft of intellectual property and violations of other state law. Moreover, students and educators have expressed concern that recording classroom activities may negatively impact the learning experience for others, especially in classes that involve questions, discussion, or participation. *To protect a learning environment in which everyone feels free to experiment with ideas, we ask you refrain from recording in ways that could make others feel reluctant to ask questions, explore new ideas, or otherwise participate in class.* Students must monitor their recording so that they do not include participation by other students without permission. Students with disabilities will continue to have appropriate accommodations for recordings as established by the Office of Accessibility Services.

Spring 2022 Tentative Schedule*

Weeks	Dates	Lectures	Labs	Readings	Others
1	1/10	Introducing the course	N/A	N/A	COSS IT Support/ArcGIS Online account
2	1/17	Martin Luther King Jr. Day (No Class)			
3	1/24	Introducing cartography (I): Maps and their usage/ArcGIS & other graphic design packages/Sources of information on cartography	Lab 1: Introducing ArcGIS Pro and Story Maps (ESRI)	Ch. 1	N/A
4	1/31	Introducing cartography (II): Thematic cartography & geovisualization/History of cartography Principles of cartography (I): Data models/Scale & generalization	Lab 2: Creating a map with ArcGIS Pro	Ch. 2, 6 & others	Term paper guidelines/ History of cartography video (1)
5	2/07	Principles of cartography (II): Coordinates and map projections/Cartographic design	Lab 3: Map design	Ch. 7, 8, 9 & 12	Introducing map reviews/Video (2)
6	2/14	Principles of cartography (III): Color basics and color decision for map production	Lab 4: Color usage	Ch.10	Map review I Video (3)
7	2/21				Term paper proposal due
8	2/28	Principles of cartography (V): Symbolization/Map element customization/Map production	Lab 5: Symbolization Lab 6: Map element customization	Ch.5,11 & 13	Term paper proposal discussion
9	3/07	Mapping techniques & geovisualization (I): Mapping technique overview/Choropleth mapping/Data classification/ Proportional symbol mapping	Lab 7: Thematic mapping	Ch. 4, 14, 16 &17	Map review II
10	3/14	Spring Break (Enjoy!)			
11	3/21	Mapping techniques & geovisualization (II): Dot and dasymetric mapping/ Multivariate mapping/Cartograms/Flow map	Lab 8: 3-D visualization (ESRI)	Ch. 18 & 19	Term paper progress
12	3/28	Mapping techniques & geovisualization (III): Map animation/Data exploration	Lab 9: Map animation (ESRI)	Ch.21 & 22	Map review III Best map design competition
13	4/04	Open-book Exam (Writing assignment)			
14	4/11	Mapping techniques & geovisualization (IV): Web mapping/Virtual environments/Others	Lab 10: Web mapping (ESRI)	Ch. 24, 25 & others	TBD
15	4/18	Term Paper Presentations/Teaching Evaluation (online)			
16	4/25	Term Paper Report (Midnight)			

**The schedule is subject to changes as needed. Please pay attention on my announcements during the class meetings or through the CANVAS system.*