The University of Iowa
College of Liberal Arts and Sciences
Department of Geographical and Sustainability Sciences
Introduction to Geographic Visualization: GEOG: 3540
Spring Semester 2016
12:30pm – 1:45pm T (248 JH), Th (243 JH)
The administrative home of this course is the College of Liberal Arts and Sciences

Instructor: Dr. Caglar Koylu
Office location: 303 Jessup Hall
Office hours: 2:00pm – 3:30pm Monday and Wednesday, or by appointment
Office Phone: 319-335-0161
Email address: caglar-koylu@uiowa.edu

Department Information:
Department of Geographical and Sustainability Sciences
DEO, Dr. David Bennett
Office location: 316 Jessup Hall
Office Phone: 319-335-0158

Description of Course
From ancient maps of Babylon, to an interactive map of the planet Mars, people have used maps as analytic tools to navigate their way and explore various geographic phenomena. Drawing from the interrelated fields of cartography, information visualization, and human-computer interaction, this course introduces the basic concepts and techniques that underlie cartographic representation and interaction and the broader field of geographic visualization. Selected topics include cartographic principles (e.g., data classification, color and symbolization), mapping techniques, interactive cartography, animation, and multivariate mapping. Weekly lab assignments are designed to provide practical skills to implement effective open-source web-based visualizations using CartoDB, JavaScript, and visualization/mapping libraries such as D3 and Leaflet.

Learning Outcomes
- Understanding of the theoretical foundation for cartographic representation, interaction and interfaces
- Thinking critically about the design of both static and interactive maps in order to support data analysis, and communication
- Cartographic skills needed to design and develop cartographic representations, and geovisualization tools.
- An operational knowledge of CartoDB, HTML, CSS, JavaScript, and open source libraries such as Leaflet and D3 as applied to web mapping.
- A web portfolio that consists of geovisualization assignments, and an interactive mapping application for the final project.

Required Textbook
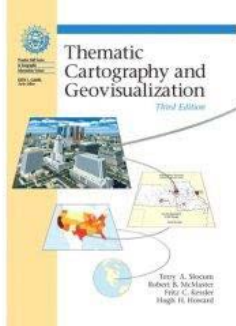
Terry Slocum, Robert McMaster, Fritz Kessler, and Hugh Howard
Hardback, Prentice Hall
3rd Edition 2009, ISBN-10: 0132298341

Additional reading assignments (research papers) will be uploaded on ICON throughout the course.

Grading System and the Use of +/-
Plus/minus grades will be given. Minimum guaranteed grade based on percentage.
A- 90%   B- 80%   C- 70%   D- 60%   F <60%
A+ *grades are given only in extraordinary situations.*

Percentage of final grade
Lab Exercises   35%
Web Portfolio   10%
Project   20%
Quizzes   5%
Midterm Exam 15%
Final Exam   15%

Grades will be based on a judgment of overall performance. Lab exercises, a web portfolio, quizzes, a midterm, a final exam, and a group final project will contribute to your grade. Lab exercises will be assigned to complement the lectures and familiarize you with geovisualization design and implementation. The labs will be graded on completeness, grammar, tidiness, and promptness (should be handed in on due date), in addition to content. Online quizzes will be given after the lecture which must be completed before the following lab.

Lab Assignments (35%)
Your ability to apply cartographic representation and interactive mapping principles learned in lecture and labs is evaluated through the lab assignments. Lab assignments (starting from Lab 3) will require you to create a web-based representation/application for a specific mapping challenge previously covered in the lectures. All lab assignments must be published online through your website (web portfolio) that you will be building as a part of the first assignment. The online link, must be accessible 1 hour prior to the lab meeting time on the due date. There is an ICON site for this course that can be accessed from http://icon.uioqa.edu/index.html. Feedback for your assignments will be provided through the item about your assignment on ICON.

A Note on Collaboration
You may choose to interact with other students while working on your assignments; however, all submitted work is expected to be your own, i.e., all write-ups and discussion statements etc., should be your own individual thoughts should be unique to you (unless the assignment is presented as a group task).

Web Portfolio (10%)
Starting from the first lab, you will be developing a web portfolio that will consist of your lab assignments and the final project. Having a web portfolio is very important if you are looking for a job that requires practical skills and experience in geovisualization and also useful for networking, and sharing your professional activities and achievements with others. Your web portfolio will be evaluated based on the following guideline:
- completeness of your lab assignments,
- the revisions made to your lab assignments in response to the instructor's feedback,
- functional (no broken links, or maps) and aesthetically pleasing web design (consistent styling),
- appropriate content: with the initial page introducing yourself, your interests and background and your attached CV

Upon the completion of this course, I highly recommend you migrate your portfolio under your domain and keep it stable for the job market.

Final Project (20%)
The goal of the final project is to provide a deeper understanding of course material gained through the lectures, discussions, and lab assignments. Projects will be carried out in a group of 3-4 students. Graduate students are allowed to work individually if the project will be a part of their Thesis or Dissertation. Regarding the increased awareness of geovisualization, geospatial information and analysis in public, and the number of jobs that require programming skills to develop geovisualization tools, the final project is especially a great opportunity for you to highlight your practical knowledge in geovisualization and include on your web portfolio. All final projects will be searched to make sure you did not directly copy an existing work done by others. While it is recommended to choose a topic that is closely related to your area of study or personal interest, you are also encouraged to work on multi-disciplinary projects with students from other disciplines. Final projects will be graded based on the following guideline:
- Finalize Groups (Due Mar 1)
- 2 page project proposal on your topic, data source and planned representation technique
  - 15% of your final project grade
  - Due March 29
- Final Project Interactive Map
  - 60% of your final project grade
  - Cartographic design (cartographic representation, clarity), and the design and functionality of the mapping interface,
  - Due May 3
- 15 minute in-class presentation
  - 10% of your final project
  - Due May 3-5
- Project page which should include information about the project as well as a link to the mapping project.
  - 10% of your final project
  - Due May 3
- A report on how the group (team) divided their work and conducted effective group work.
  - 5% of your final project grade
  - Due May 3

Final projects are encouraged to submit to international student interactive mapping competitions. Take a look at the previous projects that won awards for these competitions for inspiration and to determine the scope of your final project.

- CaGIS Map Design Competition
  http://www.cartogis.org/awards/contest.php

- NACIS Student Dynamic Map Competition
  http://nacis.org/awards/student-dynamic-map-competition/

- Robert Raskin Mashup Mapping Competition
  http://mappingideas.sdsu.edu/mashup/

Final Exam (15%)
The final exam is NOT cumulative and will only include the topics after midterm. The final examination date and time is expected to be announced by the Registrar generally by the tenth day of classes. I will announce the final examination date and time for this course on the course ICON site once it is known. Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.

Course Policies
Course attendance and participation in class discussions
Regular attendance and class participation are expected. If you are absent from class due to illness or similar valid excuse, please let me know by email about your situation as soon as possible. Projects may be presented in class depending on time availability.

Timely completion of assignments
All lab exercises are expected on their due date. Late work receives a penalty of 10% per day late. Disk errors or any other technical problems are not reason for extension for a lab. Make sure to backup copies of your work for the labs and project, apply versioning. No exercises will be accepted for grading once a graded assignment has been handed back.

Missed exams
If you are unable to take an exam due to an illness or emergency, you must send notification to the instructor prior to the exam or as soon as possible by email and special arrangements may be made to consider your situation.

Tentative Lecture and Lab Schedule

WEEK	DATE	TOPIC	READINGS	ASSIGNMENT
W1	Jan 19	Course Introduction,	Ch 1	
	Jan 21	Lab: Intro to Websites, HTML, CSS		
W2	Jan 26	Map Symbolization	Ch 5	
	Jan 28	Lab 1: Bootstrap, Web Portfolio		
W3	Feb 2	Data Normalization and Classification	Ch 4, 14	
	Feb 4	Lab : Choropleth Mapping I		Lab 1 Due
W4	Feb 9	Data Normalization and Classification	Ch 10, 14	
	Feb 11	Lab 2: Choropleth Mapping II		
W5	Feb 16	Color Theory	Ch 17	
	Feb 18	Proportional Symbol and Dot Mapping		Lab 2 Due
W6	Feb 23	Interpolation	Ch 16	
	Feb 25	Lab : Interpolation		Lab 3 Due
W7	Mar 1	Review for Midterm exam		Project Groups Due
	Mar 3	**Midterm examination (243 JH)**		**Midterm exam**
W8	Mar 8	Lab 3: Creating Isarithmic Maps		
	Mar 10	Lab 4: Clustering Point Symbols	ICON	
W9	Mar 15	<mark>Spring Break: No Classes</mark>		
	Mar 17			
W10	Mar 22	Interactive Cartography, Data Exploration		Readings Due
	Mar 24	Lab: JavaScript, DOM, SVG, and D3		Lab 3 Due
W11	Mar 29	<mark>AAG 2016: No Classes</mark>		
	Mar 31	<mark>(Work on your projects)</mark>		Lab 4 Due
W12	Apr 5	Multivariate Mapping	Ch 18, ICON	Project Data Due
	Apr 7	Lab 5: Coordinated Views		Project Proposals Due
W13	Apr 12	Animation	Ch 21, ICON	
	Apr 14	Lab 6: Spatiotemporal Visualization		Lab 5 Due
W14	Apr 19	Final Project Workshop		
	Apr 21	Final Project Workshop		Lab 6 Due
W15	Apr 26	Final Project Consultation		
	Apr 28	Final Project Workshop		
W16	May 3	**Project presentations**		Final Projects Due
	May 5			Web Portfolio Due
		Final examination TBA		**Final exam**

The College of Liberal Arts and Sciences: Important Policies and Procedures

Administrative Home
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook.

Electronic Communication
University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences. (Operations Manual, III.15.2. Scroll down to k.11.)

Accommodations for Disabilities
A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty
The College of Liberal Arts and Sciences expects all students to do their own work, as stated in the CLAS Code of Academic Honesty. Instructors fail any assignment that shows evidence of plagiarism or other forms of cheating, also reporting the student's name to the College. A student reported to the College for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

CLAS Final Examination Policies
Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

Making a Suggestion or a Complaint
Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.

Understanding Sexual Harassment
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather
In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety web site.