

Syllabus
GEO 445/545 Computer-assisted Cartography
Winter 2014

December 18, 2013

Instructor

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Teaching Assistant

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Class Schedule

Lecture: Wilkinson 108 Tuesday and Thursday 10:00–10:50 AM
Lab: Kidder 028 Friday 12:00–1:50 PM

Credits

3 credits: 2 lecture hours, 2 lab hours

Prerequisites

GEO 360 Cartography and MTH 112 Elementary Functions

Course Description

Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages.

Course Web Site

Blackboard: <http://my.oregonstate.edu>.

Students of Geo 445 and Geo 545 use the common GEO_445_001_W2014 web page.

Textbooks

Slocum T., McMaster R.B., Kessler F.C., Howard H. 2009. *Thematic Cartography and Geovisualization* (3rd ed.)

Optional: Dent, B., Torguson, J., Hodler, T. 2008 *Cartography: Thematic Map Design* (6th ed.).

Optional: Brewer C. 2005. *Designing Better Maps: A Guide for GIS Users*.

Optional: Williams, R. 2008. *Non-Designer's Design Book* (3rd ed.)

Reading assignments are required for almost all lectures, as listed in the *Course Schedule* section in this document. Students must complete the readings before attending the corresponding lecture. In-class quizzes will cover the content of the reading assignments. Additional readings besides textbook chapters will be assigned during the course. A list of additional readings can be found at the end of this document.

Course Learning Objectives

All students completing GEO 445 or Geo 545 should be able to:

- critically assess maps and identify design errors;
- apply cartographic design principles;
- apply basic layout and typography principles;

- select map projections and coordinate systems for maps at various scales;
- understand mathematical procedures for map projection and coordinate reference system transformations;
- select and apply statistical mapping methods;
- generalize raster and vector data;
- be familiar with color perception, color models and color management;
- understand vector rasterization, raster resampling and anti-aliasing issues;
- select appropriate file formats and data encoding;
- map terrain from digital elevation data and understand necessary algorithms;
- effectively use professional raster and vector graphics software;
- understand the basic procedure used to create 3D maps;
- create basic interactive web maps.

Additionally, graduate students completing GEO 545 should be able to:

- produce high-quality maps for professional publications;
- create and customize interactive web maps.

Assignments

Students will collaboratively produce an interactive atlas for iPads. This atlas will be published as a free E-book in the iBookstore. Each student will create a series of maps, diagrams, and other infographics for the atlas. Students will collaborate in teams for creating the atlas, but each student will be responsible for the design of two atlas pages. The topic and content of the atlas will be chosen during the first week of the course.

Graduate students in Geo 545 are required to provide extra contributions to the atlas. Graduate students may, create a map with advanced interactive features or animations, a static 3D map or an interactive globe for the atlas, introductory pages for book chapters, or other materials for the atlas.

Professional software will be used, such as Adobe Illustrator, Adobe Photoshop, ESRI ArcGIS, and Apple Keynote and Apple iBooks Author. If you plan to work on your private computer, you may install free trial versions of Adobe Illustrator and Adobe Photoshop that are available for 30 days. Adobe offers monthly subscription models at a reduced price for students. Apple iBooks Author can be downloaded free (Mac OS X only). OSU students can obtain a free license of ArcGIS for their home computer (Windows PC only): <http://blogs.oregonstate.edu/geo599spatialstatistics/2013/04/08/instructions-to-obtain-arcgis-10-1/> Installing software on your home computer is not a requirement, but it might be easier for you to work outside of open lab hours with your private PC.

Students will also be introduced to interactive Web mapping using SVG (Scalable Vector Graphics) and JavaScript.

Lab assignments are to be submitted electronically to Blackboard unless stated otherwise. Efforts will be made to have them graded and returned within one week after they are submitted. Late assignments will not be accepted and will be graded with 0 points.

Office Hours

Please address questions about lab assignments to the teaching assistants and instructor during lab hours. Students are requested to ask questions during lectures if presented materials need additional explanation.

The teaching assistant will have weekly office hours. The instructor is available by appointment.

Assessment

There will be no final exam, but a series of quizzes covering presented lecture materials and reading assignments. It is highly recommended students take notes during lectures because the textbook does not cover some essential information presented during lectures.

Grading

The final grade will be computed from map grades and the final exam as follows:

	Geo 445	Geo 545
Class participation and homework	5%	5%
Intro map	5%	5%
Atlas page 1	25%	20%
Interactive SVG map	5%	5%
Atlas page 2	25%	20%
Atlas page 3		15%
Presentation	10%	10%
Quizzes	25%	20%

Grades are based on the percentage of maximum points accumulated and assigned according to this table:

A	92–100%	B+	88–89%	C+	78–79%	D+	68–69%	F	<60%
A-	90–91%	B	82–87%	C	72–77%	D	62–67%		
		B-	80–81%	C-	70–71%	D-	60–61%		

Disability Accommodation

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Student Conduct, Plagiarism Policy

Assignments and projects must consist primarily of students' original work. Students are encouraged to get help from the instructor, TAs, and fellow classmates, but must not copy map elements or substantial design elements from their classmates. Students are expected to follow the OSU Student Code of Conduct posted at <http://oregonstate.edu/studentconduct/achon.htm>

Course Schedule

This course schedule is subject to adjustments, depending on the atlas type chosen at the beginning of the course.

	Topic	Reading	Due Date
1	Atlas design and atlas topic. Mapping techniques and design overview. Lab: Intro map. Introduction to Illustrator	Slocum 12 Brewer 1 iBooks (3 webpages) Field 2012	
2	Thematic mapping methods. Visual variables. Lab: Atlas page 1	Brewer & Campbell 1998 Slocum 4–5, 14–17, 19 Field 2011	Jan 15: Atlas page 1 sketch Jan 16: Intro map
3	Thematic mapping methods. Map projections Lab: Atlas page 1	Krygier 2007 Slocum 7–9	
4	Layout, color, design, typography & label placement Lab: Atlas page 1	Huffman 2011, Slocum 10–12, Brewer p.12–29, Brewer 2–5, 7, Williams 2–5, 7	
5	Generalization, Terrain mapping Lab: SVG intro	Slocum 6 Slocum 20	Feb 3: Atlas page 1 Feb 6: Atlas page 2 sketch
6	JavaScript, HTML, SVG Lab: SVG map		Feb 10: Atlas page 1 revision Feb 13: SVG intro
7	Raster data models, 3D maps Lab: Atlas page 2	Brewer p.30–37	Feb 20: SVG map
8	Vector data models Lab: Atlas page 2		
9	Coordinate reference systems and projections Lab: Atlas page 2 rev / 3	Slocum 7–9 (rep)	March 3: Atlas page 2

10	TBD Final Presentations Lab: Atlas page 2 rev / 3	March 10: Atlas page 2 revision March 13: Presentation slides
11		March 19, graduate students only: Atlas page 3

Slocum stands for Slocum et al., Thematic Cartography and Geovisualization

Brewer stands for Brewer, Designing Better Maps (optional reading)

Williams stands for Williams: The Non-Designer's Design Book (optional reading).

Slocum 12 is Chapter 12 in Slocum et al., Thematic Cartography and Geovisualization

Brewer 1 is Chapter 1 in Brewer, Designing Better Maps

Brewer p.12–29 is pages 12 to 29 in Brewer, Designing Better Maps

Reading Assignments Linked on Blackboard

Brewer and Campbell 1998. Beyond Graduated Circles- Varied Point Symbols for Representing Quantitative Data on Maps

Field K. 2011. Choropleth chorofailure. & Another day, another choropleth failure.

Field 2012. Communicating Quantities.

Huffman 2011. Assembly-line Map Elements

iBooks: Wikipedia: iBooks; Wikipedia: iBooks Author; iBooks Author webpage

Krygier 2007. Perceptual Scaling of Map Symbols