

**University of Wisconsin at Madison**  
**Introduction to Cartography (Geography 370)**  
**Fall Semester 2016**

**Instructor:** Bill Gartner

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**Office Hours:** Tu Th 1:30 -2:30 PM or by appt

**Time:** Tu Th 11:00 AM - 12:15 PM

**Place:** 1641 Humanities

**Credits:** 4

**Class Number:** 36817

**Teaching Assistants:**

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**Office Hours:** TBA

Lab 301 M 08:55-10:55 AM

Lab 302 Th 04:00-06:00 PM

Lab 303 Th 06:15-08:15 PM

Lab 304 F 09:55-11:55 AM

### **Course Synopsis and Structure**

Cartography can be broadly defined as the art, science, and ethics of map-making and map-use. Geography 370 provides a broad introduction to cartography, with an emphasis on the theory and practice of map-making from a design perspective. This class stresses the transformation of spatial data into geographically meaningful visualizations for the printed page or as static images on the web. By the end of this course you will be able to: (1) create, evaluate, and critique reference and thematic maps; (2) apply cartographic theories and practices to solve analytical problems; and (3) construct valid, visually-based arguments using computer software.

**Lecture Overview:**

The lecture component of the course details cartographic theories and techniques. General topics include map-earth relationships, data processing and classification, cartographic abstraction and signification, and the relationships between map design and human cognition. Lectures also present a series of cartographic guidelines for making maps.

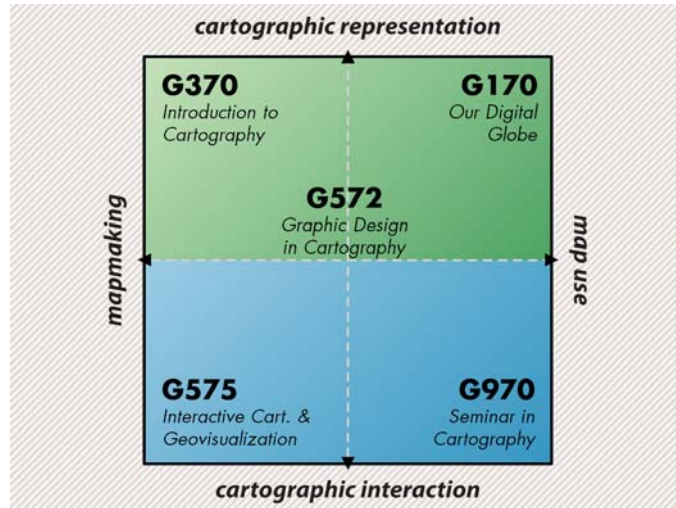
**Lab Overview:**

The laboratory component of the course emphasizes the practical skills needed to make maps on a computer. You will use both ESRI ArcGIS and Adobe Illustrator software packages to process and transform geographic data into choropleth, proportional symbol, isoline and other types of maps.

**The Articulation of Geography 370 with Other Courses**

There is no prerequisite for this course, other than sophomore standing. Geography 370 is, nevertheless an advanced foundational course for those interested in visual communication. The emphasis on cartographic design and map-making is unique to Geography 370. Cartographic design is both an art and a science. The emphasis on cartographic design and map-making compliments courses devoted to map-

use (eg Geography 170) ; GIS courses that emphasize data manipulation, analysis, and management (eg Geography 377, 578, and 579); and courses devoted to producing dynamic, interactive maps for the web (eg Geography 572 and 575). Cartography courses at the UW-Madison Geography department emphasize different components of map production, as shown below:



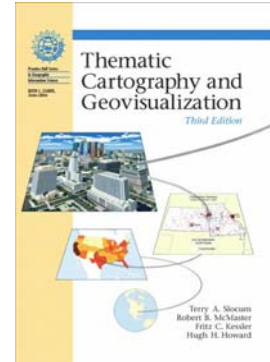
Map-making and map-use inform each other. In order to make better maps, we need to know how people use them. Conversely, map-making influences map-use. One can thus view Geography 170 and 370 idiomatically as “opposite sides of the same coin.” Geographic Information Science (GIScience) studies data structures and computational techniques to capture, store, manipulate, analyze, manage, and present spatial data. A GIS (GISystem) is an amazing and powerful software program. Yet, as the acronym implies, the GIS approach is a scientific one. An effective and valid visual argument, however, depends on design principles (cartographic representation) that draws on art as well as science (G370 and G572). The importance of art and science for crafting effective visual arguments is materialized in the practice of making maps. As you will see in the G370 labs, a common stratigraphy for making maps is to first capture, store, analyze, and manage spatial data in a GIS software package and then export the information to Adobe Illustrator; a program that affords the cartographer many artistic freedoms to create a graphic argument. Finally, many but not all, of the design principles used to make printed maps are also important for making dynamic, interactive maps on the web (G 575).

### Course Materials

You must have a USB thumb drive (flash drive) for lab. **Otherwise, there are no required textbooks or software packages for this course.** Readings will be posted on Learn@UW or put on reserve in the library. However, if you are struggling with the course materials or are considering a career in GIS/Cartography, I strongly recommend that you purchase the following textbook:

## Recommended Text

Slocum, Terry A., Robert B. McMaster, Fritz C. Kessler, and Hugh H. Howard . 2009. *Thematic Cartography and Geovisualization*, 3rd Edition. Pearson. ISBN-13: 978-0132298346



If you are considering a career in cartography, consider purchasing the following software:



### Recommended Software

Adobe Illustrator Creative Cloud (12-month student license are available through DoIT for a student discount)

## Grading

Your final grade is based on the total number of points earned throughout the semester and your rank relative to the performance of everyone else in the class. You will earn points throughout the semester from exams and quizzes, laboratory exercises, cohort assignments, and your final project.

At the end of the semester, I will generate a histogram for the class based on the total number of points earned throughout the course. I will then use statistics to determine letter grade breaks. The statistical analyses will place similar point scores into one of seven groups, with each group representing one of the conventional UW-Madison letter grades. (Technically, the method seeks to minimize point variation within groups and maximize the distance between groups on a number line). The group with the highest set of scores will have earned an "A", the group with next highest set of scores, will have earned an "AB", and so on. The net result is that your final grade is based on the total number of points earned throughout the semester and your rank relative to the performance of everyone else in the class. In most cases, this method generates the best possible grades for the most number of students. I will periodically post progress reports on your course grade throughout the semester. However, only the final histogram, the one based on the total number of points earned throughout the semester, will be used to assign your course grade.

**Exams (30% of final grade):**

There will be two exams that cover concepts and topics from lectures and the readings. Each exam will stress materials covered since the previous one. All exams will have multiple choice, T/F, and matching questions. You will have to interpret maps, pictures, graphs, or diagrams for some questions. A few questions on each exam will ask you to apply key concepts to new situations. Some evaluations may have short answer and/or essay questions that ask you to expound on a major theme in the course. The exams are closed book/notes and must be completed within one class period (75 minutes).

**Quizzes (10% of final grade):**

During many non-exam weeks, there will be an unannounced “pop quiz” at the beginning of lecture. The quizzes will ask 1 or 2 questions from the previous lecture, are open book/notes, and must be completed within the first 5 minutes of class. In-class quizzes are designed to promote active learning and attentive note-taking, as well as class attendance. Make-up quizzes require a doctor's note or, in the event of planned travel, must be rescheduled 4 weeks in advance. There is no make-up quiz if you arrive late to class. There will be 8 quizzes during the semester.

**Lab Assignments (30% of final grade):**

Your ability to apply the mapping principles learned in lecture are evaluated through a series of five lab assignments. Lab assignments are cumulative in the sense that each lab assignment builds on the theories and techniques that you learned from the previous one. Your TA will provide you with a grading rubric for each lab.

Unless otherwise noted, all lab assignments must be printed and placed in your TA's mailbox prior to the lab period meeting on the due date. Mailboxes are found on the 3rd floor of Science Hall, past the State Cartographer's Office. We also require that you upload your lab as a PDF to a Learn@UW Dropbox to ensure we have a copy of the file. It is the printed version that is graded, so please take care in color proofing the final submission.

Plagiarism is not tolerated; each lab assignment has an ‘Easter Egg’ in it to ensure you are not using another student's work from prior semesters. As with other evaluated items, any offense results in a zero for the lab assignment and disclosure of the impropriety to the Department and University.

**Cohort Assignments (10% of final grade)**

The ability to critique the work of others in a positive manner is an important design skill in Cartography. Knowing how to accept and integrate constructive input— and how to pick your battles on particular design ideas in which you strongly believe—is an equally important skill. At the start of the semester, each of you will be grouped into cohorts comprising 4 or 5 students. You will complete three assignments as a cohort across the semester:

- (1) an initial projections activity designed to familiarize you with your cohort;
- (2) peer-review of your cohort's final project proposals; and

### (3) peer-review of your cohort's presented final projects

It is highly recommended that you meet as a cohort outside of class to provide informal peer-review on labs prior to submission, as well as to study for exams. You will come to rely on your cohort as you conceptualize and implement your final project design.

#### **Final Project (20%):**

The final project is the cornerstone of G370, affording you the opportunity to apply the theories and techniques acquired throughout the course on a mapping project of your choosing. You may begin thinking about your final project topic now and, once approved, start assembling the needed geographic information to tell your visual story. Consider choosing a topic that aligns closely with your area of study (particularly if you work in one of the other sub-disciplines of Geography) or a personal interest; your enthusiasm for the mapped topic is sure to shine through to the final map product. The best final projects from G370 often are competitive in national and international student mapping competitions, including the CaGIS Map Design Competition, the NACIS Student Poster Competition, and the National Geographic Award in Mapping. We encourage you to look at past winners of these competitions (particularly those from your UW colleagues), as they are excellent examples of 'A+' final projects. Final projects from the past ~10 years are available for review in the Map Library.

#### **Penalties**

The penalty for an unexcused late lab, cohort, or final project assignment is 10% of the total score per day late. Submission of an assignment the day it is due, but after the time deadline (e.g., following your lab that day), counts as one day late. Extensions must be arranged 4 weeks in advance. Technical complications (e.g., disk errors, printing problems) are not reason for extension; be sure to back up copies of all of your work and version meticulously, as forgetting to save (or improperly saving over) your map is the easiest way to lose your work and subsequently fall behind in the course.

## Course Schedule

Week	Date	Lecture	Readings
1	9/6, 9/8	Introduction; What is a Map?	Slocum <i>et al</i> , Ch 1
2	9/13, 9/15	Geodetic, Coordinate, and Projections Systems	Olson 2007 Slocum <i>et al</i> , Ch 7, 8, 9
3	9/20, 9/22	Map Scale Map Generalization	Slocum <i>et al</i> , Ch 6
4	9/27, 9/29	Typography	Imhoff 1975 Slocum <i>et al</i> , Ch11
5	10/4, 10/6	Maps and Paramap Elements Data Classification and Visual Variables	Slocum <i>et al</i> , Ch 5, 12
6	10/11, 10/13	Map Grammar: Symbols, Signs, and Semiotics	
7	10/18, 10/20	Exam #1 Thematic Map Types	Monmonier 2005 Slocum <i>et al</i> , Ch 5
8	10/25, 10/27	Choropleth Maps	Slocum <i>et al</i> , Ch 14
9	11/1, 11/3	Color Theory Proportional Symbol Maps	Slocum <i>et al</i> , Ch 10, 17
10	11/8, 11/10	Dot and Dasymetric Maps	Rankin 2010 Slocum <i>et al</i> , Ch 15, 17
11	11/15, 11/17	Isoline Maps	Slocum <i>et al</i> , Ch 16
12	11/22	Cartograms and Flow Maps	Slocum <i>et al</i> , Ch 19
	11/24	<b>Thanksgiving</b>	
13	11/29, 12/1	Summary: The Power of Maps Exam #2	
14	12/6, 12/8	Final Project Consultations	
15	12/13, 12/15	Final Project Presentations (during lab)	

## General Lab Schedule

<b>Week</b>	<b>Date</b>	<b>Laboratory Topics</b>	<b>Exercise and Assignment Due Dates</b>
1	9/6 - 9/9	No Laboratory Meetings	
2	9/12 - 9/16	Introduction; ArcGIS fundamentals; Assign Lab #1	
3	9/19 - 9/23	Cohort Formation; Adobe Illustrator fundamentals	
4	9/26 - 9/30	Adobe Illustrator type placement; Assign Lab #2	Lab #1: Projection/Generalization
5	10/3 - 10/7	Adobe Illustrator advanced tips	Cohort #1 Assignment
6	10/10 - 10/14	Assign Lab #3 Lab #2 work time	
7	10/17 - 10/21	NACIS; No Laboratory Meetings	Lab #2: Typography
8	10/24 - 10/28	Data Sources	Final Project Proposal
9	10/31 - 11/4	Assign Lab #4 Proposal discussion with Cohort	Lab #3: Choropleth
10	11/7 - 11/11	Review cohort feedback	Cohort #2 Assignment
11	11/14 - 11/18	Assign Lab #5	Lab #4 : Proportional Symbol
12	11/21- 11/25	No Laboratory Meetings	
13	11/28 - 12/2	Final Project Work Time Cohort Critique	Lab #5: Isoline
14	12/5 - 12/9	Final Project Work Time	
15	12/12 - 12/16	Final Project Presentations	Cohort #3 Assignment
	12/16		Final Projects Due

Your TA will provide you with additional information about the lab schedule and each assignment. Lab topics and assignment due dates may be amended by the instructor at any time.

## Class Policies

- \* Readings, assignments, the class schedule, and any other component of the course may be amended by the instructor at any time.
- \* Chronic absenteeism may result in a lower or failing grade for the course at the discretion of the instructor.
- \* I will not accept late assignments unless you have an excused absence or made prior arrangements with me. I well understand the difficulties of balancing school, work, and family concerns. Please talk to me ahead of time if you have obligations that necessitate flexibility.
- \* There is no extra-credit.
- \* Academic misconduct, such as cheating or plagiarism, may result in a lower or failing grade for the course. A failing grade will be given to any plagiarized assignment. It is your responsibility to become familiar with the rules of academic misconduct, and your rights to due process, according to UW Administrative Code 14. Both an overview of academic misconduct and detailed information concerning UW Administrative Code, Chapter 14 are available at <http://www.students.wisc.edu/doso/academic-integrity/>
- \* If you need special accommodations or have a developmental disability, please contact me by phone, email, or come to my office. The McBurney Disability Resource Center provides resources for students with disabilities. Please see <http://www.mcburney.wisc.edu/> or call 263-2741.
- \* The University of Wisconsin-Madison and the Department of Geography are dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all students to familiarize themselves with University policies concerning special accommodations, misconduct, discrimination, sexual harassment, and disruptive behavior. For details, please see Chapter 14 of the UW Administrative Code cited above and the resources posted at the Office for Equity and Diversity website at <http://www.oed.wisc.edu/>.



Bill Watterson, *Calvin and Hobbes*, September 30, 1988