

Geography 370

Introduction to Cartography

Instructor

Meghan Kelly, mkelly22@wisc.edu
Office: 416 Science Hall
Office Hours: Wednesdays 1–3pm

Teaching Assistant

Zihan Song, zsong57@wisc.edu
Office: 413 Science Hall
Office Hours: Mondays 1–3pm

Lecture: Tuesday/Thursday 2:30–3:45pm in Science Hall 360

Labs: Tuesday 6:00–8:00pm and Wednesday 10:00–12:00pm in Science Hall 380

Course Overview

Geography 370 (G370) provides a general introduction to Cartography, broadly defined as the art, science, and ethics of mapmaking and map use. G370—and the UW Cartography curriculum generally—focuses upon the design of maps, drawing from research and practice on graphic design, information visualization, and semiotics, perspectives that you are unlikely to receive in other GIS courses. Specifically, G370 emphasizes mapmaking over map use (compared to G170) and print mapping over web-based or interactive mapping (compared to G572 and G575, respectively). G370 is divided into two components: lectures and lab.

Lecture Component

The lecture component of the course covers the cartographic theories, best practices, and success stories that are essential for thinking critically about map design. Lecture material is presented as a series of cartographic guidelines—developed through both scientific inquiry and time-tested convention—and associated examples illustrating the range of potential design solutions. Lectures are discriminated by topics that traditionally fall under reference mapping (Weeks #1-5) and topics that traditionally fall under thematic mapping (Weeks #6-12), although, as you will see, this is an imperfect distinction. As an introductory course, you are tested on your knowledge of and conformance to the cartographic guidelines discussed in lecture; however, by the end of the course, you will have an understanding about when these rules should be followed directly and when you can bend (or even break) these rules to improve your map.

Lab Component

The laboratory component of the course emphasizes the practical skills needed to make maps. Each lab assignment requires you to grapple with a topic previously discussed in lecture, with the final map deliverable representing your critical understanding about the topic. The labs leverage **Esri ArcGIS** and **Adobe Illustrator**; by the end of the course, it is expected that you will have operational-to-proficient knowledge of both packages, as applied for map design, and that you can indicate such on a résumé. Following the series of lab assignments, you are required to design a **final project** map on a topic of your choosing. The final project must be completed individually,

but you will be meeting regularly with a cohort of your peers to discuss and improve your designs. Creativity and ingenuity are strongly encouraged in the conceptualization and execution of the final project.

Course Requirements

G370 assumes no prior knowledge of or experience in Cartography or related fields; there are no course prerequisites (sophomore standing is required). Readings from the Slocum text are not required, but are **highly recommended** for students that are pursuing a career in Cartography and/or students struggling with specific lecture topics. The reading excerpts associated with each lecture are noted in the composite schedule and posted lecture notes.

Recommended Textbook

Thematic Cartography and Geographic Visualization, Third Edition (2009) by Terry A. Slocum, Robert B. McMaster, Fritz C. Kessler, and Hugh H. Howard. (on course reserve in the Geography Library)

Recommended Software

Adobe Illustrator Creative Cloud (12-month student license available through [DoIT](#) for a student discount). You can also download a 30-day free trial [here](#).

Required Equipment

Please be prepared at **every lab** with a **USB flash drive** to store lab materials and data and to back up your assignments. You may also save your work to the cloud. I suggest Dropbox or GoogleDrive.

At least one student loses his or her work each semester. I *highly* suggest backing up your work in more than one place and remember to SAVE SAVE SAVE. You will also want to version your work.

Evaluation

Grade Weighting

Each evaluated item represents a percentage of the total course weight. Final grades are assigned according to the composite grade distribution of the course. Under university policy, final grades are assigned to graduate and undergraduate students using separate curves.

	Item	Weight	Description
Lecture	Exam #1	15%	75-minute midterm exam. Exam will consist of multiple choice, true/false, and short answers. Exam will not be cumulative.
	Exam #2	15%	75-minute final exam. Exam will consist of multiple choice, true/false, and short answers. Exam will not be cumulative.
	Quizzes	10%	8–10 in-class quizzes covering topics from the previous lecture. Quizzes will open five minutes before class and will end five minutes into class. Please be on time!
Lab	Lab Assignments	30%	Five mapping assignments. These assignments build on each other throughout
	Final Project	20%	Individual mapping project (no group projects allowed)
	Cohort Assignments	10%	Three (possibly more) assignments completed with cohort.

Exams and Quizzes

Exams (30%): Your understanding of the lecture material is evaluated through a pair of exams and a series of quizzes. Exams constitute the majority of the lecture points and include a combination of true/false, multiple choice, and short answer questions. The exams are **closed** book/notes and must be completed within 75 minutes. The exams are **not** cumulative. Cheating during the exam is not tolerated and results in a zero for the exam and disclosure of the impropriety to the Department and University. Make-up exams require a doctor's note or, in the event of planned travel, must be rescheduled **4 weeks** in advance. Make-up exams are given in an essay format.

Quizzes (10%): In non-exam weeks, quizzes will be proctored at the beginning of lecture covering material from the prior lecture. In-class quizzes are designed to promote active learning and attentive note-taking, as well as class attendance. Quizzes are **open** book/notes and must be completed within 5 minutes. Make-up quizzes require a doctor's note or, in the event of planned travel, must be rescheduled **4 weeks** in advance; you may not complete the quiz following class if you arrive late. Lecture notes for the week will be posted only after the weekly quiz is administered.

Important Dates for Exams and Quizzes

Exam #1, Feb. 25

Exam #2, April 12

Lab Assignments

Assignments (30%): Your ability to apply the mapping principles learned in lecture is evaluated through a series of five lab assignments. Each assignment represents a mapping 'challenge', in

which you need to design a map for a specific mapping purpose. Each lab assignment builds on the last, meaning that you are responsible for properly applying previously learned mapping principles (therefore, the lab assignments **are** cumulative); a rubric is provided for each lab assignment to indicate how it is marked. All lab assignments must be **printed** and placed in Zihan's mailbox **1 hour** 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.

Grading: The penalty for a late lab assignment is **10%** of the total score per day late. Submission of an assignment the day it is due, but after the deadline (e.g., following your lab that day), counts as one day late. Extensions for labs 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. Plagiarism is not tolerated; each lab assignment has an 'Easter Egg' in it to ensure you are not using 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.

Requests for grade changes must be submitted in writing (via email) within **24 hours** of receiving your feedback. You must email your instructor (Meghan Kelly, mkelly22@wisc.edu) and your TA (Zihan Song, zsong57@wisc.edu) with your requests for grade changes.

Important Dates for Lab Assignments

Lab #1, due Week 4 (Feb. 9 and 10) before lab

Lab #2, due Week 7 (Mar. 1 and 2) before lab

Lab #3, due Week 9 (Mar. 15 and 16) before lab

Lab #4, due Week 11, FRIDAY, April 1 at noon

Lab #5, due Week 13, FRIDAY, April 15 at noon

**Please note that Lab 4 and 5 are not due before lab*

Final Project

Final Project (20%): The final project is the cornerstone of G370, affording you the opportunity to apply the theoretical and practical knowledge acquired throughout the course on a mapping project of your choosing. It is never too early to begin thinking about your final project topic, and, once selected, to begin assembling the needed geographic information to tell your visual story. It is recommended to choose 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](#); you are encouraged 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.

Cohort Assignments (10%): 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 (80% draft). 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.

Grading: Late final projects will not be accepted. You must submit the current state of your project/portfolio (however complete it is) by **May 3** to avoid a zero for the deliverables. Group projects are not allowed. Plagiarism is not tolerated; final project topics are researched to ensure you did not directly copy an existing map. As with other evaluated items, any offense results in a zero for that activity and disclosure of the impropriety to the Department and University.

Important Dates for Final Project

Final Project Proposal due Week 9 (Mar. 15 and 16) in lab
Final Project Check-in Week 14 (April 19 and 20) in lab
Final Project In-lab Presentations due Week 10 (April 26 and 27) in lab
Final Project due **May 3** at noon

Accommodations

UW-Madison encourages persons with disabilities to participate in its programs and activities; contact Meghan Kelly immediately during the first week of class, so that I can make arrangements for your needs.

In addition, if you are on a team or in a club that will be traveling during the semester, please inform me of your schedule by the second week of class so that we can make arrangements for your participation in class.

***See the course schedule on Learn@UW. Please note that the course schedule will likely change as we move through the semester. I will not, however, move exam dates. I will keep the latest schedule updated on Learn@UW. Thanks!

mk

Week	Date	Lecture/Lab Topic	Assignment	
W1	19-Jan	Course Overview and Structure		Reference Cartography
	21-Jan	Introduction to Cartography	Slocum Ch1	
	Lab	Introduction to Lab; Assign Lab #1		
W2	26-Jan	Map Projections I: The Geographic Coordinate System	Slocum Ch7; Ch8	
	28-Jan	Map Projects II: Projection Mechanics and Distortions	Slocum Ch8; Ch9	
	Lab	Introduction to ArcGIS and MapShaper; Lab #1 work time		
W3	2-Feb	Map Generalization I: Map Scale and the Cartographic Problematic	Slocum Ch6	
	4-Feb	Map Generalization II: Generalization Operators	Slocum Ch6	
	Lab	Introduction to Adobe Illustrator; Lab #1 work time; Cohort #1		
W4	9-Feb	Map Typography I: Label Appearance	Slocum Ch11; Imhoff	
	11-Feb	Map Typography II: Label Placement	Slocum Ch11	
	Lab	Type placement; Assign Lab #2	Lab #1 due; Cohort #1	
W5	16-Feb	Putting it All Together: Map Elements and Visual Hierarchy	Slocum Ch12	Thematic Cartography
	18-Feb	Symbolization I: The Visual Variables	Slocum Ch5	
	Lab	Illustrator Tips with Tanya Buckingham		
W6	23-Feb	Symbolization II: Thematic Map Types	Slocum Ch5	
	25-Feb	Exam 1: 75-minute midterm		
	Lab	Lab #2 work time		
W7	1-Mar	Choropleth Maps I: Normalization	Slocum Ch14	
	3-Mar	Choropleth Maps II: Classification	Slocum Ch14; Ch4	
	Lab	Assign Lab #3	Lab #2 due	
W8	8-Mar	Choropleth Maps III: Color Theory	Slocum Ch14; Ch10	
	10-Mar	Proportional Symbol Maps	Slocum Ch17	
	Lab	Data Tips with Jaime Stoltenberg; Lab #3 work time		
W9	15-Mar	Dot Maps and Dasymetric Maps	Slocum Ch15; Ch17	
	17-Mar	Isoline Maps	Slocum Ch16	
	Lab	Assign Lab #4; Proposal discussion with Cohort	Lab #3 due; Proposal	
W10	22-Mar	No Class: Spring Break		
	24-Mar	No Class: Spring Break		
	Lab	No Lab: Spring Break	Cohort #2	
W11	29-Mar	Cartograms	Slocum Ch19	
	31-Mar	Meghan at AAG. No Class: Visit Map Library		
	Lab	Assign Lab #5; Review cohort feedback	Lab #4 DUE FRIDAY	
W12	5-Apr	Flow Maps	Slocum Ch19	
	7-Apr	Catch-up Day		
	Lab	Design tips with Sarah Bennet; Lab #5 and final project work time		
W13	12-Apr	Exam 2: 75-minute final exam		Final Projects
	14-Apr	Professional Cartography with Tanya Buckingham	Slocum Ch13	
	Lab	Design tips with Daniel Huffman; Final project work time	Lab #5 due DUE FRIDAY	
W14	19-Apr	Final Project Consultation		
	21-Apr	Final Project Consultation		
	Lab	Final Project Check-in with Cohort (50% complete); Final project work time		
W15	26-Apr	Final Project In-Lab Presentations (80% complete)		
	28-Apr	Final Project In-Lab Presentations (80% complete)		
	Lab	Final Project In-Lab Presentations (80% complete)	Cohort #3	
W16	3-May	FINAL PROJECT DUE MAY 3 AT NOON	FINAL PROJECT DUE	