Geography 370
Introduction to Cartography

Instructor:
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Office: 375 Science Hall
Office Hours: Thursday 2:30-3:30pm; Friday 11:00-12:00pm, or by appointment

Teaching Assistants:
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Office Hours: Wednesday 11:30-1:30pm (Meiliu), 1:30-3:30pm (Alicia) in M376

Lecture (180 Science Hall):
Tuesday/Thursday 11:00am-12:15pm

Labs (380 Science Hall):
Section 301: Monday 8:55-10:55am (Alicia)
Section 302: Monday 11:00-1:00pm (Alicia)
Section 303: Thursday 4:00-6:00pm (Meiliu)
Section 304: Thursday 6:15-8:15pm (Meiliu)

Course Overview

Course Description:
Geography 370 (G370) provides a general introduction to **Cartography**, defined as the art, science, and ethics of mapmaking and map use. G370 focuses upon the design of maps, drawing from research and practice on graphic design, information visualization, and user experience (UX) design, perspectives that you are unlikely to receive in other GIS courses. Specifically, G370 emphasizes map design over map use (compared to G170) and print mapping over web-based or interactive mapping (compared to G572 and G575, respectively).

Prerequisites:
Sophomore standing or consent of the instructor. G370 assumes no prior background in cartography.

Programs/Breadth:
G370 serves undergraduate and graduate programs in Cartography/GIS, and is Physical Science breadth for L&S majors. Under university policy, undergraduates and graduates are graded on separate curves.

Credit Load:
G370 is a 4-credit course, and therefore assumes ~4 hours of classroom contact per week plus ~8 hours of self-directed study and design outside of class per week.
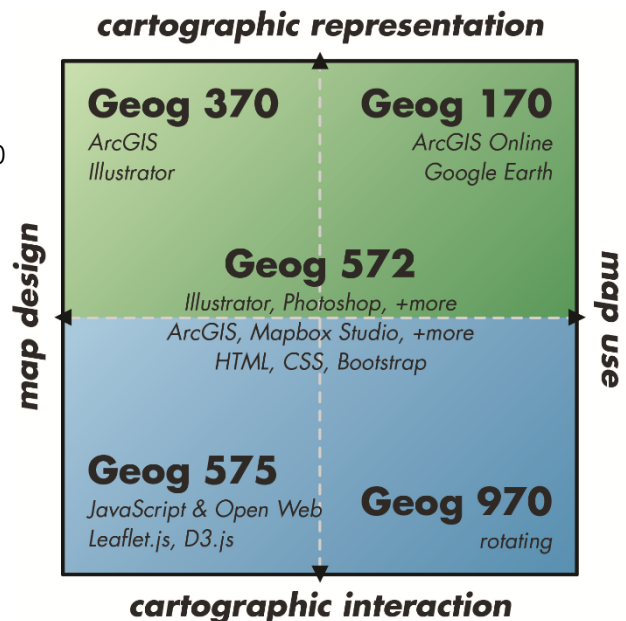
Lecture Summary (2-credits):

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. Lecture topics are loosely organized by **reference mapping** (Weeks #1-5) versus **thematic mapping** (Weeks #6-12), although 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 and when you can bend (or even break) these rules to improve your map.

Lab Summary (2-credits):

The laboratory component of the course emphasizes the practical skills needed to ***design and produce*** maps. Each lab assignment requires you to grapple with a topic previously discussed in lecture, with the final map deliverable operationalizing 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.

Learning Outcomes

Upon completion of this course, you will be able to:

> ***Design maps.*** Specifically, you will be to understand and apply principles of:
> - Map projections and the geographic coordinate system.
> - Map generalization across map scales.
> - Map typography and the design and placement of text onto maps.
> - Visual hierarchy and map layout.
> - Map symbolization and design considerations for thematic maps.
> - Statistical mapping, including levels of measurement, enumeration, normalization, and classification.
>
> ***Produce maps.*** Specifically, you will be able to:
> - Execute original map designs from conceptualization to delivery.
> - Estimate and manage your time needed for an open-ended design project.
> - Design within client-defined constraints.
> - Acquire and prepare geographic datasets.
> - Follow and deviate from a cartographic workflow using ArcGIS and Illustrator.
>
> ***Critique maps.*** Finally, you will reflect on your design and production to:
> - Consider cartographic design within its broader historical and social contexts.
> - Deconstruct maps by their elementary design components to identify opportunities and alternatives.
> - Provide constructive feedback for peers during the process of design.
> - Self-critique and edit your own designs using professional standards.

Assessment Summary

	Item	Weight	Description	Date(s)
Lecture	Exam #1	15%	75-minute midterm	10/16
	Exam #2	15%	75-minute final (non-cumulative)	11/20
	Quizzes	8%	Eight 5-minute in-class quizzes covering topics since prior quiz	throughout
Labs	Lab Assignments	25%	Four multi-week mapping challenges	Weeks #4, #7, #9, & #11
	Final Project	25%	Individual mapping project (no group projects allowed)	Proposal #10; Draft Week #14; Final 12/13
	Cohort Critique	12%	Four critique assignments completed w/ your cohort	Weeks #3, #5, #11, & #15

*All course materials, deliverables, and assessments are managed via the G370 Canvas site.

Lecture-based Assessments (38%)

Reading (Optional):
Course lectures draw from the Cartography/Visualization knowledge area of the GIS&T Body of Knowledge, the primary compendium defining core curriculum and professional expectations the geospatial industry. Readings are not required, but are ***highly recommended*** for students that are pursuing a career in Cartography and/or students struggling with specific lecture topics. Exam questions draw directly from instructional material included in the BoK. Topics still under development are supplemented with scanned chapters from the Slocum et al. (2009) text. ***Learning Outcome:*** Design.

Exams (30%):
Your understanding of design and critique is evaluated through two exams and a series of quizzes. Exams include a combination of true/false, multiple choice, short answer questions, and map critiques. 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 University. Make-up exams are rarely allowed and are given in an essay format. ***Learning Outcomes:*** Design, Critique.

Quizzes (8%):
In non-exam weeks, quizzes are proctored at the beginning of lecture covering material since the last quiz. 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 in Week #1; you may not complete the quiz following class if you arrive late. Lecture notes are posted after the quiz is administered. ***Learning Outcomes:*** Design, Critique.

Lab Assignments (25%)

Lab Assignments:
Your ability to apply the mapping principles learned in lecture is evaluated through a series of four lab assignments. Each assignment represents a mapping "challenge", in which you need to design a map for a specific mapping purpose:

1. Projection & Generalization Challenge;
2. Typography Challenge;
3. Choropleth Challenge; and
4. Proportional Symbol Challenge.

Each lab assignment builds on the last, meaning that you are responsible for applying previously learned mapping principles; thus, lab assignments ***are*** cumulative. ***Learning Outcomes***: Design, Produce.

Lab Assignment Submission:
All lab assignments must be ***printed*** and placed in your TA'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 Canvas Dropbox to ensure we have a copy of the file. The printed version is graded, so take care in color proofing the final submission.

Lab Assignment Grading:
A rubric is provided for each lab assignment to indicate how it is marked. 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 in Week #1. 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. Any offense results in a zero for the lab assignment and disclosure of the impropriety to the University. Requests for grade changes must be submitted in writing (via email) within ***24 hours*** of receiving your feedback.

Final Project (25%)

Final Project Assignment (20%):
The final project is the cornerstone of G370, affording you the opportunity to integrate your understanding of design, production, and critique 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 datasets to tell your place-based 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](#) and the [NACIS Student Poster Competition](#). Final projects from the past ~10 years are available for review in the Map Library.
Learning Outcomes: Design, Produce, Critique.

Final Project Proposal (2%):

The final project proposal follows a professional cartographic process for responding to a request for proposals (RfP). The proposal outlines your design plan, distilling the design process into incremental tasks, and includes an estimation of effort (in terms of hours) for each task. Final projects should be proposed to consume 40 hours of time, with the proposal then used to assess progress in lab. Additional information about the final project proposal format is circulated after Exam #1.

Final Project Draft (3%):

You will discuss an **_80%_** complete draft of your final project in Week #14. "80%" is defined as a map that has all graphic elements on the page (e.g., the central map representation, labels, map elements, supporting text, etc.), but remains unpolished, allowing for integration of feedback provided during the cohort activity. Final project drafts are graded on their degree of reaching the 80% threshold.

Final Project Submission:

Final project proposals and draft final projects must be uploaded by **_5:00pm_** the day prior to the lab period meeting on the due date to allow your TAs to compile deliverables for cohort discussion. Failure to upload a project proposal or draft final project on-time results in a 0% for the associated cohort critiques. Final projects must be printed and placed in your TA's mailbox at **_12pm Noon_** on the final due date. You also must upload your final project as a PDF to the Canvas Dropbox so that we have a copy of the file. The printed version is graded, so take care in color proofing the final submission.

Final Project Grading:

Late final projects will not be accepted. You must submit the current state of your project/portfolio by the deadline to avoid a zero for the deliverables. 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 University. Additional information about the final project grading is circulated after Exam #1.

Cohort Critiques (12%)

Cohort Critique Assignments (12%):

The ability to constructively critique the work of others in a positive manner is an essential design skill in Cartography. You will be grouped into cohorts comprising 4 or 5 students and complete four cohort activities across the semester:

1. An initial ice-breaking design activity designed to get to know your cohort;
2. A map critique of prior student final projects archived in the Robinson Map Library;
3. A map critique of your cohort peer's final project proposals; and
4. A map critique of your cohort's draft 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. **_Learning Outcome:_** Critique.

Cohort Critique Submission:

Critiques are **_open_** book/notes and must be uploaded to Canvas during the assigned class period.

Cohort Critique Grading:

Failure to attend the lab period or upload the critique results in a 0% for the deliverable. Make-up critiques require a doctor's note or, in the event of planned travel, must be rescheduled in Week #1.