

The University of Montana, Department of Geography

GPHY 481

# Advanced Cartographic Design

Fall Semester 2016

Wednesday Lab, 2:00-4:50 PM, Room PFNAC 014  
Thursday Lecture, 3:30-4:20 PM, Room PFNAC 014

**Instructor:** Kevin McManigal

**Office:** Room 206 Stone Hall

**Office Telephone:** (406) 243-6691

**Office Hours:** Tues 3:00-4:00, Wed 12:00-1:00 or by appointment

**Email:** kevin.mcmanigal@mso.umt.edu

**TA:** Chelsea Karthaus

**Office:** Room 307B Stone Hall

**Office Hours:** TBA

**Email:** chelsea.karthaus@umconnect.umt.edu

Open lab hours in Cobell: TBA. SH 219 is open any time Stone Hall is. I will activate everyone's GrizCard for the door slider.

## ***COURSE DESCRIPTION:***

The art of Cartography, that is the aesthetic representation of space and place, is losing the battle against the plethora of mass-produced cart junk that inundates our lives in every waking moment. Between the standardized web maps per Google and the stock menu GIS output, the sheer volume of poor maps that we are exposed to has desensitized the public into accepting a denuded pallet of dull graphic literacy. The explosion of geographic awareness, spatial data, and computing power has certainly affected our lives in many positive ways, but it comes at a cost. Lost are the subtle details within, beneath the first glance. Against the tsunami of map mayhem stands only the c-artisan. But are we living in the dying age of the cartographer? Is it time to throw in the towel and accept our fate as GIS technicians?

There is a long tradition of beautiful artistry in cartography; that of hand painted shaded relief, meticulously set type, and measured hierarchy that draws the reader into the map. Surprisingly, many of the historic techniques can be replicated within the modern cartographic workflow at a minimum of extra manipulation. This is advantageous because an attractive map will hold the users gaze, giving the cartographer precious seconds to impart the information they wish to share. This transfer of knowledge is the goal, and the well-designed map will be our medium.

This course focuses on the purpose behind the spatial presentation of data and the construction of maps that have clear messages and excellent aesthetic design. The ultimate goal of the course, expressed through the final project, is to provide the students with the skills and abilities to interview a prospective client, define map requirements, find and process the relevant data, design a map that satisfies the aesthetic guidelines, and construct the final product for actual use by the map user. The intent is to move the student beyond GIS data processing and into the realm of cartographic artistry.

### ***Course Format:***

The general program for each week will be Wednesday lab work, map proof critiques and group discussions, with Thursday reserved for lectures. However, this schedule is subject to change, and will vary with the needs of the class, workload, or in special circumstances. This is especially true towards the end of the semester.

Lecture days will start with announcements and be followed by a presentation on principles of design as applied to map construction.

Lab days will begin with an introduction to the new lab assignment. Some working lab days will begin with on-screen demonstrations of software techniques needed to complete the labs. These demos will be used to fulfill the Demonstration Tutorial write-up requirements, with spares counting as extra credit. The labs will not be written up in a button-by-button click format. You are expected to refer back to previous skills learned in other courses, tutorials provided by the instructor, and outside resources found on the web. Utilize your time in the labs to ask questions of your fellow students, the TA, and the instructor.

### ***Learning outcomes - By the end of this course you will:***

1. Understand design theory as it applies to map making and the application of these theories through the entire process of map creation.
2. Develop software skills in programs used for map production in the modern cartographic workflow.
3. Learn how to identify specific map design requirements based on users' needs and construct a product that meets the users' objectives.
4. Serve the community through the design and creation of a map product as commissioned by a community member or organization.

### ***Recommended Text:***

*The Visual Display of Quantitative Information*, by Edward Tufte, 2nd Edition, 2001.

*Cartographer's Toolkit: Colors, Typography, Patterns*, by Gretchen Peterson, 2012.

*Designing Better Maps – A Guide for GIS Users*, by Cynthia Brewer, 2005.

### ***Inspirational Text:***

*A Map of the World: The World According to Illustrators and Storytellers*, by Antoniou et. al., 2013.

*The Functional Art: An Introduction to Information Graphic and Visualization*, By Alberto Cairo, 2013.

**Required Storage:** You will need a thumb-drive or external hard drive with at least 4 GB of space. If you have a large final project, you may need more.

**Server Address:** TBA

### ***POLICIES AND PROCEDURES:***

The following policies are the minimum standards for which all students are responsible. They set the ground rules so that class can move forward in an efficient and productive manner. Please review and put into practice:

- Please consult the Class Schedule for relevant dates.
- **Moodle:** Class materials will be available on **Moodle** the week they are covered in class. Data needed for the labs will be stored in the class folder on the server that can only be accessed in the lab.
- All assignments will be turned into the digital drop-box on **Moodle** on the due date. The drop-box will close at **the specified time** and no longer accept submissions. Some maps will require printed submission as specified by the instructor.
- **Required Class Attendance:** Class will include theory, discussion, map critiques, and exercises – all of which are important to the overall understanding of map design. Much of this information will be only be available in class. If you must miss a class, **you are responsible for the material covered.** Make arrangements with another student to get their notes.
- **Participation:** This class is interactive and requires student participation in hands-on exercises and group discussions. Students that do not participate will not do well in the class. It is important to work with your fellow students and share ideas. They will be your best resource for missed material, design advice, technique tips, and moral support.
- No cell phones **on** in class! Please make sure your cell phone is off before lecture begins.
- **Be on time!** I expect everyone to be on time for class in order to not disturb the lecture. Do not leave the class early. If you have a special reason for leaving early, please contact me before class begins and sit close to the door in order to exit quietly.
- Please do not surf the internet during class. While I am lecturing or we are engaged in group discussion, power off the computer screen. Those caught surfing the web during these times will be asked to leave.

- For assistance with writing, please consult the on-line resources of the UM Writing Center, Liberal Arts 144 at: [www.umt.edu/writingcenter](http://www.umt.edu/writingcenter).
- Student Conduct Code: Consult the Dean of Students website at: [http://www.umt.edu/vpsa/policies/student\\_conduct.php](http://www.umt.edu/vpsa/policies/student_conduct.php). Carefully review the sections on plagiarism [also consult the UM Catalog]. Cheating and plagiarism are not tolerated and will be dealt with as outlined in the Code.
- This course is accessible to and usable by otherwise qualified students with disabilities. To request reasonable program modifications, please consult with the instructor. Disability Services for Students will assist the instructor and student in the modification process. For more information, visit the Disability Services website at <http://www.umt.edu/disability>.
- Syllabus is subject to change.

### ***CLASS ASSIGNMENTS:***

- ***Lab exercises***  
Labs will consist of exercises that provide a means to put theory as presented through the lectures and reading material into practice. The labs are software intensive utilizing, ESRI ArcGIS, Adobe Illustrator, Adobe Photoshop, and Adobe InDesign. The labs are presented with some structure but require that the student create and implement maps of their own design, seeking additional resources for data and software techniques. Maps will go through one round of class critique where the students will receive feedback from the entire class. **Students will rate each submission on a 1-10 point scale and the average of those ratings will contribute to the final score for the lab. If you do not submit the proof on the due date, you lose 10% of the points for that lab.** There will be time for revisions and then the final map will be submitted to the instructor. The labs gradually become worth more points as the semester progresses and they become more difficult. See grading table below for specific point values.
- ***Service Learning Project***  
A semester-long assignment, the service learning project requires the student to identify an individual or organization in the community in need of a map. Students will work with that person(s) to implement a professional final product based on requirements defined in conjunction with the client. The final product must be accepted and signed off by the client. The design and production process will be documented and backed-up in a Project Management Folder formatted as required by the instructor. The final map will be shown to the public and your map user during a gallery opening at the end of the semester. The **500 point** project is worth roughly 25% of your total grade and is divided as follows:

<b>Digital or Printed Map</b>	<b>350 pts.</b>
<b>Gallery Presentation</b>	<b>100 pts.</b>
<b>Project Management Folder</b>	<b>50 pts.</b>

- ***Read and Respond***  
Beyond the ample technique readings, every other week we will read a cartographic design related paper. You must submit a one page response that presents a distillation of the paper's main point, and then offers your opinion of the author's premise. We will debate the responses in a class discussion that is led by a team of two students. Your one page response is due in the Moodle drop-box before the discussion, after which no further submissions will be allowed. Of the 7 group discussions we hold, you are required to submit at least **5 Responses worth 20 points each (100pts. total)**. The other two can be used for extra credit.
- ***Demonstration Tutorials***  
There will be multiple on-screen demonstrations of various cartographic techniques in the software used in class. You must take notes of the techniques in class, apply the steps to complete your labs, and then write a one page tutorial that explains the workflow in a format that will be covered. They are due the week after they were demonstrated. You are responsible for writing up **10 Demonstration Tutorials worth 10 points each (100 pts. total)**. Up to 5 spare tutorials can be written up for extra credit. Completed tutorials belong in your Resource Notebook.
- ***Resource Notebook***  
Each student is required to put together a digital notebook that will be filled with tutorials, handouts, readings, labs and other content featured in the class. The purpose of this notebook is to give the students a "take-away" resource of cartography techniques for future mapping projects. It should be organized with these folders inside your Student Folder on the server: Labs, Readings, Responses, Final\_Project and Tutorials. Feel free to create other categories if you like (for example; Inspiration), but it should contain all the course materials. Do not wait until the last minute to put together the notebook. Start adding content the first week and continue to keep it organized throughout the semester. The notebook will be reviewed toward the end of the semester for a grade worth **100 points**.
- ***Advanced Tutorial Project – Graduate Students Only***  
Graduate students are required to submit an additional project, both written and presented, to fulfill the graduate increment. Each student will be asked to explore additional functionality and techniques in the software of their choice (e.g. ESRI or an Adobe product) that would be of benefit to the class as a whole in the creation and design of maps. This functionality must be documented in a detailed tutorial of several pages and demonstrated in a presentation to the class. The graduate tutorial is worth **100 points**. See the instructor to get approval and/or ideas for the project.

THESE ASSIGNMENTS WILL BE ALL THAT DETERMINES YOUR FINAL GRADE, so make sure and turn them in on time and complete.

***There are no late assignments accepted after the due date***  
**PERIOD!**

If you are having trouble with a project, come and see me well before it is due. If you have an emergency, illness, or crisis; send an email, call, or dispatch a carrier pigeon to me before the assignment is due. Once the due date and time have passed, no excuses will be entertained.

**THIS IS AN EXTREMELY DEMANDING CLASS. DO NOT FALL BEHIND ON THE ASSIGNMENTS; CATCHING-UP WITH BE VIRTUALLY IMPOSSIBLE!**

***GRADING:***

The tables below break down the point values for all the exercises. Grades are evaluated on the completeness and organization of the project, the use of the design theory techniques taught in class, and the implementation of revisions suggested by peers and the instructor. Maps will not be graded purely on a subjective assessment of aesthetic appeal; however, an ugly map is certainly worth less than a pleasing one. Not everyone is an artist, but the student should demonstrate progress toward cartographic competency. All assignments, as well as the final grade, are based on the following grade scale:

- A ..... 95 – 100%
- A- ..... 90 – 94.99%
- B+ ..... 87 – 89.99%
- B ..... 83 – 86.99%
- B- ..... 80 – 82.99%
- C+ ..... 77 – 79.99%
- C ..... 73 – 76.99%
- C- ..... 70 – 72.99%
- D ..... 60 – 69.99%
- F ..... 59.99% and below

\*Please note that in order to be fair to all students, I will not round up a grade. For example, if you earn 79.99%, you will receive a ‘C+’ in the course. Since there are no “A+” marks, an “A” grade requires 95% or higher and is reserved for students with the highest work ethic.

**Grading: Undergraduate**

**Grading: Graduate**

<b>Assignments</b>	<b>Points</b>	<b>Assignments</b>	<b>Points</b>
Lab 1	100 pts.	Lab 1	100 pts.
Lab 2	150 pts.	Lab 2	150 pts.
Lab 3	200 pts.	Lab 3	200 pts.
Lab 4	250 pts.	Lab 4	250 pts.
Lab 5	300 pts.	Lab 5	300 pts.
Lab 6	100 pts.	Lab 6	100 pts.
Read & Respond	5 x 20 = 100 pts.	Read & Respond	5 x 20 = 100 pts.
Demo Tutorials	10 x 10 = 100 pts.	Demo Tutorials	10 x 10 = 100 pts.
Resource Notebook	100 pts.	Resource Notebook	100 pts.
Final Project	500 pts.	Final Project	500 pts.
		Grad Tutorial	100 pts.
<b>Total</b>	<b>1900 pts.</b>	<b>Total</b>	<b>2000 pts.</b>

Class Schedule		
Week/Day	Topic	Assigned Reading
<i>Week 1: Introduction to Map Design</i>		
Wed, 8/31	Welcome, Syllabus, Final Projects, NACIS, CartoTalk. Lecture: Introduction to Map Design	*R&R #1
Thurs, 9/1	Adobe Illustrator Tutorials Start Lab 1: Cartographic Logos	*Illustrator Handouts
<i>Week 2: The Art of Typography</i>		
Wed, 9/7	<b>R&amp;R #1 Due Before Class Discussion</b> Demonstration Tutorial and Lab Work	*Brewer Type
Thurs, 9/8	Lecture: Font is Everything!	
<i>Week 3: Purpose and Audience in Map Design</i>		
Weds, 9/14	<b>Lab 1: Proof Due Before Class</b> Start Lab 2: Souvenir Map for Tourists Demonstration Tutorial and Lab Work	*R&R #2 *Brewer Design
Thurs, 9/15	Lecture: Purpose and Audience	
<b>Lab 1: Final Due Sunday, 9/18 by Midnight</b>		
<i>Week 4: The Use and Value of Color</i>		
Wed, 9/21	<b>R&amp;R #2 Due Before Class Discussion</b> Demonstration Tutorial and Lab Work	*Peterson Color *Brewer Color
Thurs, 9/22	Lecture: Color as Communication	
<b>Final Project: Client Interview Due Sunday 9/25 by Midnight</b>		
<i>Week 5: The Symbolization of Cartographic Relief</i>		
Wed, 9/28	<b>Lab 2: Proof Due Before Class</b> Start Lab 3: Alaska Map	*R&R #3 *Relief Readings
Thurs, 9/29	Lecture: Shaded Relief as Art Onto Itself	
<b>Lab 2: Final Due Sunday, 10/2 by Midnight</b>		
<i>Week 6: The Use of Photoshop in Cartography</i>		
Wed, 10/5	<b>R&amp;R #3 Due Before Class Discussion</b> Demonstration Tutorial and Lab Work	*R&R #4 *Photoshop Handout
Thurs, 10/6	Lecture: Introduction to Photoshop	
<b>Final Project: Signed Client Contract Due Sunday 10/9 by Midnight</b>		

Week/Day	Topic	Assigned Reading
<b>Week 7: Cartographic Production Workflow</b>		
Wed, 10/12	<b>R&amp;R #4 Due Before Class Discussion</b> <b>Lab 3: Proof Due Before Class</b> Demonstration Tutorial and Lab Work	
Thurs, 10/13	Lecture: Processes for Mass-production	
<b>Final Project: Data Inventory Table Due Sunday 10/16 by Midnight</b>		
<b>Week 8: Graphic Design in Maps</b>		
Wed, 10/19	NACIS Continue work an Lab 3	*R&R #5 *InDesign Handout
Thurs, 10/20	NACIS Design Movie	
<b>Lab 3: Final Due Sunday, 10/23 by Midnight</b>		
<b>Week 9: The Presentation of Maps</b>		
Wed, 10/26	<b>R&amp;R #5 Due Before Class Discussion</b> Start Lab 4: Mini Atlas Graduate Presentations and Lab Work	*Sustainable Maps *Birdseye-view Maps
Thurs, 10/27	Lecture: Map Presentation	
<b>Final Project: Map Style Sheet Due Sunday 10/30 by Midnight</b>		
<b>Week 10: Maps and Power: Use and Abuse</b>		
Wed, 11/2	Graduate Presentations and Lab Work	*R&R #6 *Critical Political Maps
Thurs, 11/3	Maps of Power and Propaganda	
<b>Final Project: Rough Proof to Client (Recommended) Sunday 11/6 by Midnight</b>		
<b>Week 11: Maps in Info-Graphics</b>		
Wed, 11/9	<b>R&amp;R #6 Due Before Class Discussion</b> <b>Lab 4: Proof Due Before Class</b> Start Lab 5: Info-Cartographic Poster	* Info-Graphic Handouts
Thurs, 11/10	Lecture: Rise of the Info-Graphic	
<b>Lab 4: Final Due Sunday, 11/13 by Midnight</b>		
<b>Week 12: Meet the Professional Cartographer</b>		
Wed, 11/16	<b>Lab 5: Proof Due Before Class</b> Demonstration Tutorial and Lab Work	*R&R #7 *Modern Cart in the Digital World
Thurs, 11/17	Guest Lecture From a Working Cartographer	
<b>Lab 5: Final Due Tuesday, 11/22 by Midnight</b>		

<b>Week/Day</b>	<b>Topic</b>	<b>Assigned Reading</b>
<b>Week 13: THANKSGIVING WEEK Final Project Work</b>		
Wed, 11/23	<b>*Thanksgiving Travel, NO CLASS*</b> Project Work	*Film Theory and Maps
Thurs, 11/24	<b>*Thanksgiving, NO CLASS*</b> Project Work	
<b>Final Project: Second Proof to Client (Recommended) Sunday 11/27 by Midnight</b>		
<b>Week 14: Non-GIS Cartographic Workflows</b>		
Wed, 11/30	<b>R&amp;R #7 Due Before Class Discussion</b> Start Lab 6: Magazine Map – Fast Turnaround	*Art-Machines and Map Recipes
Thurs, 12/1	Lecture: Mapping Under the Gun	
<b>Lab 6: Final Due Friday, 12/2 by Midnight</b>		
<b>Week 15: Final Project Gallery Opening</b>		
Wed, 12/7	Lab 6 Critique Final Project Map Proof Critique (Printed) Lecture: The Cartographic Family	*Robinson and Woodward
Thurs, 12/8	<b>Final Project Printed and Ready for Gallery</b>	
<b>Final Project: Final Proof to Client and Instructor by Tues 12/6 by Midnight</b>		
<b>Week 16: Finals Week —Projects Due</b>		
Wed, 12/14	<b>Resource Notebook: Due In Class</b> Last Chance Lab / Project Work	*Whatever You Like!
Thurs, 12/15	<b>Final Projects Due by 5 PM w/ form signed</b>	