Geography 3040: Principles of Cartography (4 credits)
Fall 2014

Lecture: Tuesday & Thursday 9:10 – 10:30AM (MLIB 1130)

Instructor: Ingrid Weinbauer
Email: ingrid.weinbauer@geog.utah.edu
Office: OSH 159E   Phone: 585-9167
Office Hours: MW 12-1PM, T 12:15-1:15PM, or by appointment

Required Textbook:

Course Description/Objectives:
This class is the department’s basic course in cartography and is a foundation for other courses, including GIS and remote sensing. The principles of cartography do not change; they are based in the configuration, geometry, and measurement of the Earth. We will consider these principles in light of new technological advances that govern modern cartography. In lecture we will discuss the concepts to consider in creating a “good” map and you will learn to apply them in the lab sessions. Making maps is more than downloading data off the web and pushing buttons, and we will discover and discuss these ideas and concepts together throughout the semester.

Learning Outcomes:
- Clearly articulate the map purpose and the audience.
- Design effective maps by carefully considering each aspect of the map design process as it relates to the map purpose and the audience.
- Make appropriate design decisions for the output medium and the production equipment.
- Compose map elements (e.g., title, scale, legend, etc.) to enhance the map purpose.
- Strategically reduce detail and emphasize the map purpose using generalization techniques.
- Effectively use type, symbols, and color to communicate the map purpose.
- Use visual variables to emphasize important data characteristics.
- Choose appropriate map projections and understand what is distorted.
- Make informed decisions about data classification.
- Implement thematic mapping techniques.
- Critique other people’s maps.

Course Format and Learning Methods:
The course includes both a lecture and a laboratory component. Lectures are designed to present concepts. The class will also be engaged in small group exercises designed to deepen the understanding of the concepts and to practice making design decisions based on them.
In the labs you will make maps using ESRI software using techniques and ideas we cover in lectures.

Class and Lab Policies:
Participation in both lecture and lab is expected and will be reflected in your grade. Note: If you do not ATTEND you CANNOT participate. Reading assignments are expected to be completed BEFORE class.

There will be two in-class exams. These cannot be made up. In order to receive a passing grade for the course, you must be passing BOTH lecture and lab.
**Current Cartography/Map Critique Group Presentation**
Maps are everywhere and used to convey many different types of information. Most lecture days, one or two groups (2 students each) will be asked to present a map that they found in the newspaper, online, in a magazine, an advertisement, etc. and tell the class what the map was designed for, what is good about it, what is not good, and how it might be changed to more effectively convey the information. This presentation should include a power point slide of the map to share, and take about 5-8 minutes. Feel free to pose questions to the class for discussion. A sign up sheet will be passed around on the second day of class.

**Quizzes/Exercises/Activities**
Participation leads to higher levels of learning and thus be graded using in-class and out-of-class activities. Activities will be announced in class only. Examples include: group problem-solving activities, hand-out activities, film/discussion activities, and quizzes.

**Final Map Project**
The final map project is the opportunity for you to take the skills and knowledge you have learned throughout the course and use them to create a map (e.g., thematic map). This project will give you the opportunity to apply the cartographic conventions/map design principles you have been learning all semester. There are several “checkpoints” along the way for Seth and I to review your work and give you feedback and the project culminates in an gallery display and review by your peers at the end of the semester.

**Grading for the Lecture Component:**
Exam 1: 20%
Exam 2: 20%
Current Cartography/Map Critique: 5%
Quizzes, Activities, Exercises: 10%

**Grading for the Lab Component:**
Lab Exercises: 20%
Final Project: 20%
Lab Quizzes: 5%

**GEOGRAPHY DEPARTMENT ACADEMIC MISCONDUCT POLICY**

**Academic misconduct will not be tolerated.** Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities. Academic misconduct includes, but is not limited to, cheating, misrepresenting one’s work, and plagiarism:

- **Cheating** involves the unauthorized possession or use of information in an academic exercise, including unauthorized communication with another person during an exercise such as an examination.
- **Misrepresenting one’s work** includes, but is not limited to, representing material prepared by another as one’s own work or submitting the same work in more than one course without prior permission of all instructors.
- **Plagiarism** means the intentional unacknowledged use or incorporation of any other person’s work in one’s own work offered for academic consideration or public presentation.

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD) to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.
Class Schedule: (subject to change)

Lab Assignments/Topics

Week 1: Chapter 1
8/26: Introduction
8/28: Current Cartography, History of Cartography (“The Shape of the World”)

Lab Guidelines, Accounts

Week 2: Chapter 2
9/2: History Continued, Eratosthenes
9/4: Maps, Scale, Longitude (“In Search of Longitude”)

Library and Map Intro (Lab 1)

Week 3: Chapter 12, 13 and 14
9/9: Map Design-Map Elements, Composition
9/11: Map Design-Typography, Color

Map Design I: Tools and Toolbars (Lab 2)

Week 4: Chapter 3
9/16: Projections
9/18: Projections

Map Design II and Intro to ArcGIS: Typography (Lab 3)

Week 5: Chapter 2
9/23: Coordinate Systems, Datums, Route Selection
9/25: Great Circle Route

Map Projections (Lab 4)

Week 6: Chapters 4 and 5
9/30: Levels of Measurement, Symbols
10/2: Data Classification and Exercise, Generalization

Final Project Requirements, Project Ideas

Geographic Data and the Internet: Accessing Data (Lab 5)

Week 7:
10/7: Catch-Up; Review; AGRC Guest Lecture
10/9: EXAM 1

Fall Break: 10/14 and 10/16

Geographic Data in ArcGIS: Digitizing and Attribute Tables (Lab 6)

Small Group Peer-Review of Final Project Proposal

Week 8: Chapter 6
10/21: Choropleth Map
10/23: Choropleth Map

Map Design III: Choropleth Maps (Lab 7)

Week 9: Chapter 7
10/28: Dot Maps
10/30: Dot Maps

Mock Map Gallery of Draft 1

Week 10: Chapter 8
11/4: Proportional Symbol Maps
11/6: Proportional Symbol Maps

Map Design IV: Proportional Symbols and Pie Charts (Lab 8)

Week 11: Chapters 9 and 10
11/11: Isarithmic Maps
11/13: Flow Maps, Cartograms
**Week 12:** *How to Lie with Maps*  
Mock Map Gallery of Draft 2  
11/18: Map Design-Wrap-Up, Power of Maps  
11/20: Map Misuse (“Mapping the World 2”), Map Animation

**Week 13:** TBA  
11/25: Dr. Ridd Guest Lecture  
11/27: Thanksgiving

**Week 14:** TBA  
Mock Map Gallery of Draft 3  
12/2: Aerial Photos, Remote Sensing, and GIS  
12/4: Terrain Representation

**Week 15:**  
Open Lab (Final Map Project)  
12/9: Catch-Up, Review  
12/11: **EXAM II**

**ATTENTION:** **Monday, December 15, 2014 (Final Exam period) 8:00-10:00AM**, meet to complete map review in hallways outside OSH 270, grade based on your participation and reviews of your peers’ maps! **Attendance is mandatory!**

This syllabus is not a binding legal contact. It may be modified by the instructor when the student is given reasonable notice of the modification.
Geography 3040 – Principles of Cartography
Lab Policies and Procedures
Fall 2014

Lab Instructor: Seth Bishop
Email: Seth.Bishop@utah.edu

Office: OSH 334 (use stairs by coffee bar to access)

Office Hours: Monday 11:45 AM – 2:45 PM [OSH 334]
(Otherwise by appointment)

Lab Sections [OSH 277]:
002: Tuesday 10:45 AM – 12:05 PM
003: Tuesday 12:25 PM – 1:45 PM
005: Thursday 12:25 PM – 1:45 PM

Recommended Equipment:
USB/Flash drive (8 GB or larger recommended, 4 GB next best)

Lab Overview:
Cartography is a mix of art and science. This lab will teach you the technical skills involved with map production and ESRI ArcGIS software. We will also focus on design principles for effective cartographic communication. This can be a challenging course. The work that you put into learning the techniques and the principles will make you a good candidate for a wide variety of jobs in GIS and mapping.

Lab Objectives:
Upon successful completion of this course, students will have the skills necessary to produce thematic maps that (1) effectively communicate geographic information, and (2) maintain the cartographic conventions discussed in lecture.

Assignments:
There will be 8 lab assignments over the course of this semester. Students have one week to complete each assignment. Students must submit two copies of each completed lab:
1) An electronic copy uploaded to canvas by the start time of the subsequent week’s class.
2) A physical black-and-white copy handed in at the start of the subsequent week’s class.

So for example, students in Section 002 who are assigned a lab on September 2nd will need to upload the completed lab to the appropriate assignment folder in Canvas by 10:45am on September 9, and give me a black and white copy in class. The printers in the labs may be used by swiping your student ID and paying .08 cents/page from your U-card.

Late penalties will be assessed against the Canvas upload time of the digital lab copy, not the physical copy. If the completed lab is uploaded to Canvas after the start time of class on the due date, the standard one-day late penalty will be assessed. The majority of these assignments will require time outside of class to complete. Plan accordingly.

Late assignments will be marked down 10% for each day they are late. If you have special circumstances that will lead to missing multiple due dates (e.g. military service, prolonged illness, jury duty, etc.) accommodations may be made, but you will be required to provide appropriate documentation.

I will do my best to return graded labs within 2 weeks. Please take the time to read through any written comments. If you have questions, I encourage you to ask.
Grading – Cartography Lab Component:

- Lab Exercises: 20%
  - There are 9 lab exercises; 8 labs + 1 final project proposal
    - Each lab is worth approximately 10-20 points
- Final Map Project: 20%
- Quizzes and Map Gallery Participation: 5%
  - Map gallery participation is mandatory on the days indicated in the class schedule.
* There will be no extra credit opportunities.

Attendance:

Attendance is strongly encouraged. Students who regularly attend class tend to do better. You are responsible for all information covered during labs, and you are required to submit assignments by the required deadlines. Students absent during a quiz will not be permitted to make up the assessment unless appropriate documentation is provided for a pre-approved special circumstance.

If you need to attend a different lab because of a unique event (travel, illness, etc.), you are still expected to turn in assignments at the beginning of your assigned lab time (or earlier) to avoid losing points. If possible, notify me in advance if you will be attending a lab other than your assigned section.

Software:

You will be learning to use ESRI’s ArcGIS Desktop 10.2 (ArcInfo) software, which can be found on all Windows 7 workstations in the CSBS computing labs. I also encourage you to use the CSBS Virtual Lab, accessible at http://apps.csbs.utah.edu. Furthermore, you may also have a physical copy for your personal computer. The ESRI ArcGIS Desktop 10 (ArcInfo) software packets provided are for academic use only.

The following labs are available for student use, but please be aware of posted class schedules so you do not interrupt classes in progress. Please note that food and drink are not allowed in the computer labs.

CSBS Computer Labs:
- OSH 277: 41 Windows 7 workstations
- OSH 273: 41 Windows 7 workstations
- Beh S 101: 41 Windows 7 workstations
- AEB 330: 32 Windows 7 workstations

General Computer Guidelines:

All data necessary to complete the course and the lab itself will be available on Canvas. Students have the responsibility to save and keep track of their own work. Students can save their work on their personal CSBS network drive which is listed as your UNID with the letter designation N: This drive is only accessible on CSBS computers.

The network folder can be accessed from any CSBS computer by clicking Start > Run... > and then typing:

```
\fs.csbs.utah.edu\courses\geog3040\mapit.bat
```

It is **highly recommend that you back up your work on an external storage device** in addition to saving your work on the network drive (this is a good practice for any class). Network drives have minimal available space and have failed in the past resulting in lost data; such an occurrence will **not** be an acceptable excuse for turning work in late. Saving often and backing up is very important!

Keep in mind, when saving to your network drive, that CSBS computing has implemented data storage limits of 100 MB for student accounts. When you near your storage limit, you will receive a warning message. If you go over your limit, you may be locked out of the system. This will **not** be an acceptable excuse for turning work in late, so please be aware of your disk space! Some of you may be enrolled in several lab-based classes (i.e. GIS, remote sensing). If you find that you are continually running...
up against storage limits, you can request additional disk space. Questions about quotas can be addressed to the helpdesk through http://support.csbs.utah.edu.

Many different students use the CSBS computer labs. Please protect your accounts by making sure you log off every time you finish using the computer, and DO NOT share your CSBS account log-on information. Also, be aware that the CSBS computers will automatically log you out after approximately 15 minutes of idle time – keep this in mind if you decide to take a break.

Lab Format:

The cartography labs are an opportunity for you to apply the knowledge you gain through lectures and reading. The labs are designed to give you a practical, hands-on experience, thus lectures will be kept to a minimum. I will begin each lab section with a brief introduction to the new assignment and discussion of the skills necessary to complete the assignment. The rest of the lab time will be available to work on the current assignment. I will place a dry erase marker at the front of the room. If you need assistance, write your name on the board. This allows me to address questions in the order they arise.

You are encouraged to help your neighbors if they run into technical problems that you can address. However, each person is responsible for completing his own work. For example, you can tell someone how to get to a function within the program, but make sure you let him or her implement the solution (i.e. let them drive the mouse). File sharing is not allowed. Academic misconduct (see the University of Utah Academic Policies online) will be reported and pursued to the fullest extent of Departmental authority. If you have concerns about what constitutes legitimate help, please talk to me or Professor Weinbauer.

If you feel that you need additional assistance, we can set up an appointment to work one on one. If I am in the computer lab with a student who has scheduled an appointment, that student has primary claim to my assistance. If I am in the computer lab outside of scheduled lab and office hours, I will generally be happy to answer questions. That said, I am not allowed to aid students with their lab assignments during the course lecture time slot. Please keep in mind that I am also a student and there will be times when I need to focus on my own work.

Geography Department Academic Misconduct Policy

Academic misconduct will not be tolerated. Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities. Academic misconduct includes, but is not limited to, cheating, misrepresenting one’s work, and plagiarism:

- Cheating involves the unauthorized possession or use of information in an academic exercise, including unauthorized communication with another person during an exercise such as an examination.
- Misrepresenting one’s work includes, but is not limited to, representing material prepared by another as one’s own work or submitting the same work in more than one course without prior permission of all instructors.
- Plagiarism means the intentional unacknowledged use or incorporation of any other person’s work in one’s own work offered for academic consideration or public presentation.

Faculty and Student Responsibilities:

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.
Disability Services:
The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD. CDS will work with you and the instructor to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

<table>
<thead>
<tr>
<th>CLASS SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Subject to Change)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LECTURE TOPICS</th>
<th>LAB TOPICS</th>
<th>LAB ASSIGNMENTS (DUE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong>: Chapter 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/26: Syllabus</td>
<td>Lab Guidelines, Accounts</td>
<td></td>
</tr>
<tr>
<td>8/28: Introduction/History</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 2</strong>: Chapter 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/2: History, Eratosthenes</td>
<td>Library and Map Intro</td>
<td></td>
</tr>
<tr>
<td>9/4: Maps, Scale, Longitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 3</strong>: Chapter 12, 13 and 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/9: Map Design-Map Elements, Composition</td>
<td>Map Design I (Tools and Toolbars)</td>
<td>Lab 1: Library Intro</td>
</tr>
<tr>
<td>9/11: Map Design-Typography, Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 4</strong>: Chapter 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/16: Projections</td>
<td>Map Design II and Intro to ESRI's ArcGIS Typography</td>
<td>Lab 2: Tools and Toolbars</td>
</tr>
<tr>
<td>9/18: Projections</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 5</strong>: Chapter 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/23: Coordinate Systems, Datums, Route Selection</td>
<td>Map Projections (Projections)</td>
<td>Lab 3: Typography</td>
</tr>
<tr>
<td>9/25: Great Circle Route</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 6</strong>: Chapters 4 and 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/30: Levels of Measurement, Symbols</td>
<td>Final Project Requirements, Project Ideas</td>
<td>Lab 4: Projections</td>
</tr>
<tr>
<td>10/2: Data Classification, Generalization</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 7</strong>: Chapter 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/7: Catch-Up; Review</td>
<td>Geographic Data and the Internet (Data Acquisition)</td>
<td></td>
</tr>
<tr>
<td>10/9: EXAM 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall Break: 10/14 and 10/16</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 8</strong>: Chapter 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/21: Choropleth Map</td>
<td>Geographic Data in ArcGIS (Digitizing and Attribute Tables)</td>
<td>Lab 5: Data Acquisition</td>
</tr>
<tr>
<td>10/23: Choropleth Map</td>
<td>Final Map Projects - Small Group Peer Review</td>
<td>Final Project Proposal Due</td>
</tr>
<tr>
<td><strong>Week 9</strong>: Chapter 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/28: Dot Maps</td>
<td>Map Design III - Choropleth Maps (Joining Tables and Choropleth Maps)</td>
<td>Lab 6: Digitizing and Attribute Tables</td>
</tr>
<tr>
<td>10/30: Dot Maps</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 10</strong>: Chapter 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/4: Proportional Symbol Maps</td>
<td>Mock Map Gallery of Draft 1</td>
<td>Lab 7: Joining Tables and Choropleth Maps</td>
</tr>
<tr>
<td>11/6: Proportional Symbol Maps</td>
<td></td>
<td>Final Map Draft 1</td>
</tr>
</tbody>
</table>
### Week 11: Chapters 9 and 10
- **11/11:** Isarithmic Maps
- **11/13:** Flow Maps, Cartograms

### Week 12: How to Lie with Maps
- **11/18:** Map Misuse
- **11/20:** Map Animation

### Week 13:
- **11/25:** TBA
- **11/27:** Thanksgiving

### Week 14: TBA
- **12/2:** Aerial Photos, Remote Sensing, and GIS
- **12/4:** Aerial Photos, Remote Sensing, and GIS

### Week 15
- **12/9:** Review
- **12/11:** EXAM II

### Week 16
**Final Project and Peer Review**
- **Monday 12/15**
  - (8:00 – 10:00am)
  - *Attendance Mandatory*

---

**ATTENTION:** **MONDAY 12/15/2014 (Final Exam period) 8:00-10:00am**, meet to complete map review in hallways outside OSH 270, grade based on your participation and reviews of your peers’ maps! Attendance is mandatory!

---

**Note:** *This syllabus may be modified by the instructor when the student is given reasonable notice of the modification. The lab policies and procedures above are supplemental to, and in no way supersede, the syllabus provided by Professor Weinbauer.*