# GEO4184 Computer Cartography

(Fall 2005)

**Instructor:**
Dr. Xiaojun Yang, 304 Bellamy, Phone: 644-8379, Email: xyang@fsu.edu

**Class Hours:**
Mondays: 9:00 -11:30 a.m., 320 Bellamy Building (COSS GIS Lab)

**Office Hours:**
Wednesdays and Fridays: 1:00 – 2:30 p.m., or by appointment.

**Teaching Assistant:**
TBA

**Computing Lab Manager (any problem related to computer system):**
Mr. Shawn Lewers (SWL2727@mailer.fsu.edu)

## Course Description and Objectives

This course examines the design and implementation of effective visualization of geographic data, phenomena, patterns, and processes. It trains students the skills in creating professional-quality maps and other visual products that are used as a communication product or for data exploration. Students will have a deeper understanding of the theoretical basis that is formed by cartography, visual perception and communication models. The course consists of lectures, computer-based map design exercises, map reviews, and an independent research project. The lecture focuses on cartographic principles, mapping techniques, and visualization methods (such as animation, interactive data exploration, and virtual reality). A substantial component of this course is comprised of sequential map design and production exercises that involve the use of one or more leading commercial software packages such as ArcGIS and CorelDraw.

## Prerequisite

Currently, there is no prerequisite listed for this course. However, a basic understanding of mapping science and a comfortable use of computer should be essential for this course.

## Computing Environment, Software and GIS Lab Policies

Windows based ArcGIS (and extensions) and CorelDraw Graphics Suite software packages will be used for class assignments. ***However, you must be aware that this is not a software training course. If you are looking for such a course (learning a specific software package), you should visit the homepages for specific software packages. These vendors may provide short training courses or more software-specific training materials.***

You will be given a temporary account in order to log on a computer in COSS GIS Lab. This account may expire by the end of the semester. When you are at the computer lab, you must observe the COSS GIS lab and FSU's related policies. The GIS lab rules include (on the following page):

- *No food or drink in the lab.*
- *Lab computers are for GIS work only. Your other class work is to be done in other labs.*
- *Lab printers are for GIS work only.*
- *DO NOT install software without permission from your instructor or the lab manager. If you need software, ask!*
- *DO NOT save your work on the local machines. Use your Z:\ drive. If you use the local machine or temp directory, others will be able to see your work and it may not be there later.*
- *DO NOT waste color prints, as they are expensive. Use the black and white printer whenever possible.*
- *Be courteous of others in the lab and stay quiet.*
- *Clean up after yourself. Lab attendants will throw out things that are left behind.*
- *DO NOT remove equipment that belongs in the lab from the lab. You will be criminally prosecuted if you are caught.*
- *DO NOT download MP3 or movie files. Most of these websites are compromised by viruses.*
- *Always log-off the computers when you are done, but DO Not shut them down.*
- *No instant messaging is allowed.*
- *Follow the FSU Honor Code and Code of Conduct rules and behave in an adult-like manner.*

***It is your responsibility to check and observe these rules. Any violation of these rules can result in the loss of privileges to use this facility. If that happens, it is your responsibility to find an alternative so that you could work on your lab assignments. If you are unsure about a rule or rules, ask a lab employee or Shawn Lewers (swl2727@fsu.edu).***

**Course Blackbroad Site**

The Blackbroad will be used to host the course lecture and lab materials. You may find the lecture slides there, but there is no guarantee that these lecture materials will be available on time. You will still need to take notes during a lecture session. You are required to check that site from time to time because some important announcements may be posted there. The Bloackbroad address is: http://campus.fsu.edu. You will need to use your FSU email account username and password to access this site.

**Grading Polices**

***System:***

| | | | |
|---|---|---|---|
| A | 94-100 | C | 72-76 |
| A- | 90-93 | C- | 70-71 |
| B+ | 87-89 | D+ | 66-69 |
| B | 84-86 | D | 62-65 |
| B- | 80-83 | D- | 60-61 |
| C+ | 77-79 | F | < 59 |

In qualitative terms, the grade standards are: **A,** Outstanding, few errors or omissions (if any); **B,** Good, only minor errors/omissions; **C**, Satisfactory, at least one major error/omission; **D**, Poor, several major errors/omissions; and **F**, Fail: many major errors/omissions.

***Components:***

| *Components* | *Description* | *Weights* |
|---|---|---|
| Lab assignments | There are about 10 labs that need to be completed within a fixed time frame. | 50% |
| Map review and critique | Critical review of maps and other visual products | 10% |
| Exam 1 | 75 minutes | 15% |
| Exam 2 | 75 minutes | 15% |
| Mini project | work on an assigned project, result representation and reporting | 10% |

***Attendance:***

Students are required to attend all classes and be punctual. Missing even one lecture can affect your grade substantially. Announcements regarding the course outline and the schedule of the lectures, labs and exam (including changes of these) may be made in class. All organizational/administrative announcements made during the class period are assumed to be known by all students. ***Cell phones, pagers, alarms, laptops, calculators, and other electronic devices must be turned off in class at all times. In a lecture session, please do not log on any lab computer!***

***Exams:***

The exam can involve any material covered in lectures, reading or discussion assignments, and labs. There is no provision for extra credit work. No make-up exam is allowed. If you miss the exam, you must present a signed physician's excuse or, if the exam is missed due to a family funeral, a dated newspaper obituary. Most other excuses for missing the exam are not acceptable. This policy will be applied stickily.

***Lab grading policies:***

Grades of your lab exercises are based on the quality of your answers. Any answer should be concise and be well organized. They must be **in print**. The grade for each of the exercises is reported as *points_scored /total_points_of_exercise*. For example, if an assignment is worth 20 points and your answers score16 points then you should see 16/20 on your marked assignment.

Each of the assignments will have a due day clearly written on the first page of your lab assignment. The due time is 5:00 p.m. on the due day. Any assignment that is turned in after the due time on the due day is considered late, which will receive penalty strictly.

The penalty for a late assignment is based on the number of days late (including weekends). If an assignment is late less than 24 hours, it is considered 1 day late. If an assignment is late less than 48 hours but more than 24 hours, it is considered 2 days late, and so on. Late assignments are penalized **20%** per day. Here is the formula for calculating the points of a late assignment:

*Points_get = Points_scored - 0.20*num_days_late*Points_scored*

The minimum value of Points_get is 0. Assignments handed in after I have returned the graded

assignment to class (usually one week after the due date) will receive no points. Again, you must provide acceptable excuse (see exam section) in order to receive more time for you to complete lab exercises without penalty applied. You should discuss with your lab instructor about your situation no later than the due day. This policy will be applied stickily.

***Note that every person must hand in his or her own lab assignments. Working together is permitted and encouraged, BUT each person will be graded separately, must answer "creative response" questions independently, and must create his or her OWN maps. Turning in identical or substantially similar assignments will result in significant grade reduction.***

***Map reviews and critiques:***
A set of maps or other visual products will be provided or identified, which will be reviewed critically using cartographic design principles. A review report for each map is needed.

***Mini-project:***
Will be announced later.

## Course Materials

**Required text:**

- Slocum, T., McMaster, R. B., Kessler, F. C., and Howard, H. H., 2005. *Thematic Cartography and Geographic Visualization. Second Edition*. Upper Saddle River, NJ: Prentice Hall. 518p.

In addition to the above required text, a few selected chapters from the following books and other journals will be used as reading assignments:

- Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., and Guptill, S. C., 1995. *Elements of Cartography*. 6th ed. New York: John Wiley and Sons.
- Dent, B. D., 1999. *Cartography: Thematic Map Design*. Boston: The McGraw-Hill Companies.
- Monmonier, M., 1993. *Mapping it out*. Chicago: The University of Chicago Press.

***Journal articles:***
In this course, journal articles will be recommended to students to read. Students should constantly check the following journals for useful articles on GIS theories and applications:

- *Cartography and Geographic Information Science* (the cartography journal for ACSM; more emphasizing GIS use in cartography).
- *Cartographica* (the international journal for geographic information and geovisualization).
- *The Cartographic Journal* (an established journal of record and comment containing authoritative articles and international papers on all aspects of cartography, the science and technology of presenting, communicating and analysing spatial relationships by means of maps and other geographical representations of the Earth's surface)
- *Cartographica Helvetica* (Journal for the history of cartography)
- *GIScience & Remote Sensing* ( Quarterly research journal devoted to publishing original, peer-reviewed articles associated with geographic information systems (GIS), cartography, remote sensing of the environment, geocomputation, and geographical and environmental modeling)
- *International Journal of Geographical Information Science* (a premier GIS journal)

## Honor Code

Students are expected to uphold the Academic Honor Code. The Academic Honor System of The Florida State University is based on the premise that each student has the responsibility to:

- Uphold the highest standards of academic integrity in the student's own work,
- Refuse to tolerate violations of academic integrity in the University community, and
- Foster a high sense of integrity and social responsibility on the part of the University community.

***PLAGIARISM: All submitted assignments must be your own original, independent work. All sources must be properly cited, (especially in the graduate student paper). Ask the instructor if you are unsure what to do. Plagiarism will result in significant grade reduction***.

## ADA Requirements

Students with disabilities needing academic accommodations should:

- Register with and provide documentation to the Student Disability Resource Center (SDRC).
- Bring a letter to the instructor form the SDRC indicating you need academic accommodations.

This should be done within the first week of class.

For more information about services available to FSU students with disabilities, contact the Assistant Dean of Students: sdrc@admin.fsu.edu, Disabled Student Services, 08 Kellum Hall, Florida State University, Tallahassee, FL 32306-4066, (850) 644-9566.

**Tentative Schedule**
(Fall 2005)

| Weeks | Dates | Lectures | Labs | Chapter Reading Assignments | Remarks |
|---|---|---|---|---|---|
| 1 | 8/29 | Introduction to the course; Computer basics ArcGIS overview | Lab 1: Introduction to ArcGIS (optional lab provided from ESRI Virtual Campus) | Chapters 1&2 | Video show: Mapmakers (1) |
| 2 | 9/05 | **Labor Day; No Class** | | | |
| 3 | 9/12 | Scale and generalization; coordinates and projections | Lab 2: CorelDraw Basics (tuturials) | Chapters 7, 8, &9 | Video show: Mapmakers (2) |
| 4 | 9/19 | Cartographic design, symbolization and color | Lab 3: Symbolization and color | Chapter 11, 10 & 4 | Map review |
| 5 | 9/16 | Choropleth mapping and data classification | Lab 4: Customizing map elements | Chapter 13 | Map reading and assessment |
| 6 | 10/03 | Isarithmic mapping and spatial interpolation | Lab 5: Choropleth mapping and classification | Chapter 14 | Map review |
| 7 | 10/10 | Terrain mapping Proportional symbol mapping | Lab 6: Spatial interpolation and terrain mapping | Chapters 15 &16 | Map review |
| 8 | 10/17 | **Exam One** | lab hours | NA | |
| 9 | 10/24 | Dot and dasymetric mapping | Lab 7: Proportional symbol and dot mapping | Chapter 17 | Map review |
| 10 | 10/31 | Bivariate and multivariate mapping | Lab 8: Bivariate and multivariate mapping | Chapter 18 | Map review |
| 11 | 11/07 | Cartogram Flowline mapping | Lab 9: Cartogram | Cartogram Creator (web post); Chapter 19 | Map review |
| 12 | 11/14 | Map animation and interactive cartography | Lab 10: Flying-by movie | Chapter 20 | Map review |
| 13 | 11/21 | Issues and future of Cartography | Independent project or lab | Chapters 21, 24 &25 | Map review |
| 14 | 11/28 | **Exam Two** | Reserved for a mini-Project | | |
| 15 | 12/05 | Reserved for a mini-Project | | | |
| 16 | 12/12 | **Mini-project presentation** | **Mini-project report due by December 12, 2005 (midnight)** | | |