

GEOG 484 Introduction to Geographic Information Systems (Spring 2011)

Web site <http://geography.sdsu.edu/People/Pages/tsou/geog484/>

Facebook: [Geospatial Technology at SDSU](#)

Blackboard (for email only): <https://blackboard.sdsu.edu/>

Lectures: Monday 9:00am - 10:40am Location: Storm Hall 338 (SAL lab)

Labs: Wednesday 9:00am – 11:40am

(Note: the actual lecture and lab schedules might be switched or modified based on the teaching needs.)

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Office Hour: Monday 11:00AM – 1:00PM
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Office Hour: Thursdays from 12:30pm to
1:30pm or by appointment.

Overview: This course is designed to demonstrate interdisciplinary features in Geographic Information Systems (GISystems), which involves geography, cartography, computer science, GPS, and remote sensing. The lectures and lab exercises will provide an introductory knowledge of GIScience and a balance among spatial analysis theory, computer technology, and GISystems techniques. Students will learn how to get spatial data into the computer, to organize data so that spatial patterns can be explored, and to learn basic GIS concepts such as query and map overlay. In addition to the basic training of GIS software and techniques, this class will enable students to:

1. Communicate with GIS professionals regarding both theoretical and technical issues.
2. Work in groups to conduct GIS projects, which reflects current GIS industry tasks.
3. Have critical thinking capability, examine various geography problems by using GIS tools.

Prerequisites: Three units from Geography 104, 380, 381, 488, or from computer programming. Students should have basic understanding of Cartography or some experiences in using computer software.

Required Textbooks:

- **Longley, Paul A.**, Goodchild, Michael F., Maguire, David J., and David W. Rhind. (2010) *Geographic Information Systems and Science (Third Edition)*, John Wiley and Sons, Toronto. (This is the same textbook adopted for GEOG104, if you already have the textbook for 104, you don't need to buy another).

Additional reading and lecture notes will be available from the Blackboard Course Reading folder.

Lectures: Lecture sessions emphasize the principles and concepts of GISystems, including spatial analysis theory, GIS operations, and computer technology.

Labs Exercise: Students must attend all lab sessions. Lab exercises focus on the training of GISystems skills, combining ArcGIS on-line help tutorials, ESRI Virtual Campus courses and

customized local community projects. Students are required to attend all lab sessions and complete all labs to receive a passing grade. To encourage good attendance, students must **sign-in** for each lab session. **Two points will be taken off the whole course final grade for each missed lab.** Lab assignments are due at the beginning of the next lab session. Late assignments will be docked 20% per day, beginning effective on the due date. The maximum late deduction is 70%. Students must hand in all assignments by **5PM on May 13 (Friday), 2011** to receive a passing grade regardless of how many points have been docked.

Grading: **Class participation (lectures): 5%; Lab exercises: 40%;
Focus Group Presentation 10%, Midterm Exam: 20%;
Final project: 25%**

A level (A and A-): above 90 points.

B level (B+, B, B-): 80 – 89.

C level (C+, C, C-): 70 – 79.

D level (D+, D, D-): 60 – 69.

F: below 60.

Focus Group Discussion and Presentation (10%).

3-4 students will form a focus group for a specific GIS scenario or topic. Each group will represent different key players in the scenario and brainstorm the best practice and solution for the GIS scenario. **Each group will make a final presentation (Eight minutes for each group + Two minutes Q&A) on March 2 (Wednesday)** during the class by all members from the focus group. Focus groups can utilize the ESRI on-line mapping tools, PowerPoint, or the additional presentation resource from the ArcGIS Explorer Online during the group presentation.

Final Project (25%).

3-4 students will form a “project team” after the mid-term exam, and choose a possible GIS research topic. Each team will present the proposal on **April 4** (5 minutes) and select a team coordinator, who will coordinate the work plan of the GIS project. Each team will report their progress each week after the mid-term exam. On **May 9 (Monday)** each team has to present the GIS project in front of the class as the final exam and then submit GIS project reports in paper format. The paper should include two parts:

Group report (10-15 pages, double space), Individual report (3-5 pages, double space):

Detail descriptions of Final project will be mentioned later before the mid-term exam.

Additional Readings: (in the Blackboard course site “Readings” folder).

1. Coppock, J. T., & Rhind, D. W. (1991). The History of GIS. In D. J. Maguire, M. F. Goodchild, & D. W. Rhind (editors), *Geographical Information Systems: Principles and Applications* (Vol. 1). Harlow, U.K.: Longman Group. pp. 21-43.
2. Goodchild, M. F. (1990). Keynote Address: Spatial Information Science. In *Proceedings of the 4th International Symposium on Spatial Data Handling, Zurich, Switzerland*. pp. 3-12.
3. Steinitz, C., Parker, P., & Jordon, L. (1976). Hand-Draw Overlays: Their History and Prospective Use. *Landscape Architecture*, September, pp. 444-445.
4. Tsou, Ming-Hsiang (2009). Chapter 48: The Integration of Internet GIS and Wireless Mobile GIS. In *Manual of Geographic Information Systems*, edited by Marguerite Madden, published by the American Society for Photogrammetry and Remote Sensing (ASPRS), pp. 923-933.

	Week	Lecture	Reading	Lab Exercise
1	19 Jan	Introduction to GIS and GIS Applications	Chapter 1 and 2	No lab this week
2	24 Jan 26	GIS data model (vector and raster) and generalization	Chapter 3 Steinitz	ESRI Virtual Campus: Learning ArcGIS Desktop (for ArcGIS 10)
3	31 Jan 2 Feb	The nature of geographic data and Georeferencing	Chapter 4 and 5 Goodchild	ESRI Virtual Campus: Learning ArcGIS Desktop (for ArcGIS 10)
4	7 Feb 9	Uncertainty and Metadata	Chapter 6 Coppock	Introduction to ArcGIS Explorer Online and Data Download (from SANDAG)
5	14 Feb 16	GIS software and Data Modeling	Chapter 7 and 8	Understanding Map Projections and Coordinate Systems
6	21 Feb 23	Data collection and Volunteered Geographic Information (VGI)	Chapter 9	Cartographic Design Using ArcGIS
7	28 Feb 2 Mar	GIS databases (Intro group projects)	Chapter 10	Focus Group Presentation (March 2) Geodatabases (Virtual course) and Using ArcCatalog: Tips and Tricks (<i>Please bring a headphone with you</i>)
8	7 Mar 9	GeoWeb and Mobile GIS	Chapter 11 Tsou	ArcGIS Editing Tutorial (from Help documents).
9	14 Mar 16	Cartography and Visualization	Chapter 12 and 13	3D Analyst Tutorial (from Help documents).
10	21 Mar 23	Mid-Term Exam (Mar 21)		Geocoding Tutorial (from Help documents)
11	28 Mar 30	Spring Break (NO CLASS)		(NO LAB session)
12	4 Apr 6	Spatial Data Analysis and Inference (<i>Submit group project proposals – April 4</i>)	Chapter 14 and 15	Spatial Analyst Tutorial (from Help documents)
13	11 Apr 13	Remote Sensing and GPS AAG meeting (No class on April 13).		NO Lab session (April 13)
14	18 Apr 20	GIS modeling	Chapter 16	Creating tools with ModelBuilder tutorial (from Help documents) Group Project
15	25 Apr 27	GIS project management and Ethic issues	Chapter 17 and 18	Group Project
16	2 May 4	GIS society and global challenges	Chapter 19 and 20	Group Project
17	9 May	Final Group Project Presentation (9AM – 11AM).		
	13 May	Final Group Project Report DUE and all lab exercises DUE.		