GEOG 484 Introduction to Geographic Information Systems (Spring 2013)
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, Wednesday, 9:00am - 9:50am   Location: GMCS- 309
Labs: Section 1: Monday: 10am – 10:50am, Wednesday 10:00am – 11:50am GA-122
          Section 2: Monday: 11:am – 1:40pm. GA-122

Instructor: Dr. Ming-Hsiang Tsou   TAs: Philip Elder (Section 1)
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Office Hour: Wednesday 12PM – 2PM   (Section 2: Dara Seidl dseidl@mail.sdsu.edu)
or appt. (619) 594-0205

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, exanimate 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 and 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 session. 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 80%. Students must hand in all assignments by **5PM on May 13 (Monday), 2013** to receive a passing grade if applicable by adjusting the deducting points due to the missed lab sessions.

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 focus group presentation (Eight minutes for each group + Two minutes Q&A) on March 13 (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 8** (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 13 (Monday)** each team has to present the GIS project in front of the class as the final exam and then on **May 16 (Thursday),** each team coordinator should submit their GIS project reports by emails to the instructor (mtsou@mail.sdsu.edu) by 5pm. The digital format of the project reports should include two parts:

- Group report (10-15 pages, double space), (One report from one group)
- Individual report (3-5 pages, double space from each member) (everyone in the group need to write their individual reports)

Both Group report and individual reports will be combined together by the team coordinator in a single email. (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	23 Jan	Introduction to GIS and GIS Applications	Chapter 1 and 2 Abler	**No lab this week**
2	28 Jan 30	GIS data model (vector and raster) and generalization	Chapter 3 Steinitz	ESRI Virtual Campus: Learning ArcGIS Desktop (for ArcGIS 10: Part-1)
3	4 Feb 6 Feb	The nature of geographic data and Georeferencing	Chapter 4 and 5 Goodchild	ESRI Virtual Campus: Learning ArcGIS Desktop (for ArcGIS 10: Part-2) (Optional: Understanding Map Projections and Coordinate Systems).
4	18 Feb 20	Uncertainty and Metadata	Chapter 6 Coppock	ESRI Virtual Campus: Learning ArcGIS Desktop (for ArcGIS 10: Part-3)
5	25 Feb 27	GIS software and Data Modeling	Chapter 7 and 8 Sinton	ArcGIS Editing Tutorial (from Help documents)
6	4 Mar 6	Data collection and Volunteered Geographic Information (VGI)	Chapter 9	Introduction to ArcGIS Explorer Online and Data Download (from SANDAG)
7	11 Mar 13 Mar	GIS databases (Intro group projects) **Focus Group Presentation (March 13) 10%**	Chapter 10	Geodatabases (Virtual course) and Using ArcCatalog: Tips and Tricks *(Please bring a headphone with you)*
8	18 Mar 20	GeoWeb and Mobile GIS	Chapter 11 Tsou	Creating Data: SDSU campus mapping project
9	**25 Mar** 27 Mar	**Mid-Term Exam (Mar 25, 8:50am – 9:50am** - 10 mins earlier) Cartography and Visualization	Chapter 12 and 13	Cartographic Design Using ArcGIS
11	1 Apr 3 Apr	**Spring Break (NO CLASS)**		*(NO LAB session)*
13	8 Apr **10 Apr**	Remote Sensing and GPS *(Submit group project proposals – April 8* **AAG meeting (No class on April 10).**		Geocoding Tutorial (from Help documents) (Apr 08).
12	15 Apr 17	Spatial Data Analysis and Inference*)*	Chapter 14 and 15	Spatial Analyst Tutorial (from Help documents)
14	22 Apr 24	GIS modeling	Chapter 16	3D Analyst Tutorial (from Help documents).
15	29 Apr 1 May	GIS project management and Ethic issues	Chapter 17 and 18	Group Project
16	6 May 8 May	GIS society and global challenges	Chapter 19 and 20	Group Project
17	**13 May**	**Final Group Project Presentation (8AM – 10AM).** **All late lab reports DUE by 5pm on May 13, 2013 (in Instructor's Mailbox: TSOU).**		
	16 May	**Email the Final Reports by 5pm on May 16, 2013 (Include both group and individual reports). (Email to mtsou@mail.sdsu.edu by Team coordinator).**		