GEOG 581 Cartographic Design

(Advanced GIS-based mapping and Web-based cartographic techniques)
(Fall 2004) Web site → http://map.sdsu.edu/geog581/

Lectures: Thur. 12:30pm - 13:20pm (SH248), 14:00am-14:50pm (SH338)
Labs: Thur. 15:00pm - 16:40pm Lab room: Storm Hall 338

Instructor: Dr. Ming-Hsiang Tsou
Storm Hall 326
mtsou@mail.sdsu.edu
Office Hour: Monday 4:00pm-5:00pm, Tuesday 11:00am-12:00am,
or by appt. (619) 594-0205

No TA for this course.

Overview:

Effective cartographic design is the key to a successful communication between map makers and map readers. This course will focus on computer-assisted map production techniques with emphasis on GIS mapping tools (ArcGIS and ArcIMS) and web-based cartographic design issues (Animation and Visualization). Geovisualization and communication will be the two major cartographic topics focused in lecture sessions. The lab exercises will introduce ArcGIS extensions (such as Maplex, PLTS and 3D tools) for the design of large-size professional paper maps. Web-based multimedia software (Flash) will also be used for the design of web-based interactive maps. The learning goals of this course are

- To learn advanced cartographic principles and theories.
- To establish hand-on experiences on cartographic techniques and software packages.
- To explore the future research topics in advanced cartography.

Required Textbooks:

- MacEachren, Alan M. (2004). *How Maps Work: Representation, Visualization, and Design*. New York: The Guilford Press. (Paper Back Edition) ISBN: 157230040X.
- Slocum, Terry A., McMaster, Robert B., Kesssler, Fritz C, and Howard, Hugh H. (2004). *Thematic Cartography and Visualization. (Second Edition*). Upper Saddle River, NJ: Prentice Hall. ISBN: 0130351237.

Lectures:
Lectures focus on advanced topics of cartographic design, including geovisualization and communication theories. Also, web-based cartography and the state-of-the-art mapping tools will be introduced and demonstrated in the lecture sessions.

Lab Exercises: The lab exercises will focus on the practical GIS software trainings in ArcGIS cartographic functions and web design tools for Internet mapping services. Students must attend each lab session. Lab exercises focus on the training of cartographic design skills by using ArcGIS, ArcIMS and Flash software package.

Grading: Midterm exam 25%, Lab exercises 30%, Group project and Web design 40%, Class participation (assignments) 5%.

Graduate students will have an additional assignment (one short essay for related cartographic research topics). (Additional 10%) The short essay should be double-spaces, 12-point fonts and between 4 - 6 pages. Examples of essay topics are the following (you can choose your own topics):

1. The history and development of web-based mapping techniques.
2. The differences between geovisualization paradigm and communication paradigm.
3. GIS vs. Cartography: What are the differences between them?
4. Color use for qualitative data.

(Find more topics from the *Cartography and Geographic Information Science* Journal).

Group Project: 2-3 students will form a group project for web-based design exercises. Details will be announced before the mid-term exam.

Additional Readings: (one copy of these papers in the Geography Reading Room SH 319 and electronic copies in the Z:/data/readings/ drive)

WEEK		LECTURE	READING	LAB EXERCISE
1	31 Aug 2 Sep	Introduction Technological Change and Visualization	Slocum Ch.1	NO Lab this week
2	Sep 9	Symbolization Analytical Cartography	Slocum Ch.4 Christman, 1998 Tobler, 1976	Introduction to ArcGIS extensions.
3	Sep 16	Color Use and Topography	Slocum Ch.10, 15	Hill shade and Masking
4	Sep 23	Geovisualization	MacEachren Ch.1	ArcGIS 3D
5	Sep 30	Visual Cognition	MacEachren Ch.2, 3	ArcGIS Maplex
6	Oct 7	Elements of Cartographic Design and Map Reproduction	Slocum. Ch. 11, 12	ArcGIS PLTS
7	Oct 14	**(Exam Questions)** Knowledge schemata	MacEachren Ch.4	Map production
8	Oct 21	**Mid-term Exam (25%)**		**NO lab this week (GIScience 2004)**
9	Oct 28	Map Representation I	MacEachren Ch.5	Group project and Dreamwaver
10	Nov 4	Map Animation	Slocum. Ch. 20	Flash Animation I
11	Nov 11	Map Representation II	MacEachren Ch.6, 7	Flash Animation II
12	Nov 18	Web-based Geographic Information Services	Buttenfield, 1998, Tsou, 2004	Group Project
13	Nov 25	**Thanksgiving (NO class this week)**		NO lab this week
14	Dec 2	Visual Thinking and Visualization	MacEachren Ch.8,9,10	Group Project
15	Dec 9	The future of cartography	Slocum. Ch. 25. Clarke, 2002.	**Group Project Presentation**
	14 Dec	13:00 – 15:00 Office hour.	**Due day for Group project Report (15:00).**	

Additional Reading:

Buttenfield, B. P. (1998). Looking Forward: Geographic Information Services and Libraries in the Future. *Cartography and Geographic Information Systems*, Vol 25(3), pp. 161-171.

Chrisman, N. R. (1998). Rethinking Levels of Measurement for Cartography. *Cartography and Geographic Information Systems*, Vol 25(4), pp. 231-242.

Clarke, K. C., Dana, P. H. and Hastings, J. T. (2002) "A new world geographic reference system", *Cartography and Geographic Information Science*, vol. 29 (4), pp. 355-362.

Tobler, W. R. (1976). Analytical Cartography. *The American Cartography*, Vol 3 (1), pp. 21-31. URL: http://www.geog.ucsb.edu/~tobler/publications/pdf_docs/cartography/Analytic_1.pdf

Tsou, M. H. (2004). Present realities and the future of Internet GIS. GIS@development, Vol 8(7), pp. 29-32.