GEOG 583 Internet Mapping and Distributed GIServices

Web site → http://map.sdsu.edu/geog583 (Spring 2018)

Blackboard URL: https://blackboard.sdsu.edu/

Facebook: https://www.facebook.com/SDSUgeospatial

Lectures: **Thursday**: (I) **9:30AM - 10:50 AM**, **Room: Storm Hall 324** (II) technology demo 11:00AM-11:30PM , Labs: (III) **Thursday: 12:00PM - 1:40 PM (Storm Hall 324).**
Optional lab time (without instructor): Thurs. 9:30pm – 10:45pm (Storm Hall 324).

Instructor: Dr. Ming-Hsiang Tsou
Storm Hall Room 313C
mtsou@mail.sdsu.edu

Office Hours: Tuesday 12:00pm – 1:50pm.
or by appt. (email).

Overview: This course introduces current development of Internet mapping and advanced cartographic skills in web-based maps. By using web-authoring tools (Microsoft Expression Web), Virtual Globes (Google Earth and ArcGIS Explorer), open source tools (Leaflet, GeoJSON, R) and Internet Map servers (ESRI ArcGIS Online, ESRI Story Map, and MapBox APIs), students can learn both the techniques of Internet mapping and the principles of web-based cartography, including multimedia, animation, 3D visualization, and user interface design. The lectures will focus on the theories and principles behind the Internet mapping, including distributed component technologies, graphic designs, and network communications. The lab exercises will focus on the practical applications and Web design skills for Internet mapping services. Students learning outcomes of this course are:

1. Articulate the technical framework of Internet mapping, including distributed component technologies, client/server architecture, computer graphics, and network communications.
2. Articulate the principles of web-based cartography, including multimedia, animation, 3D visualization, and user interface design
3. Create web-based maps by using web-authoring tools or Internet map servers.
4. Design and implement Internet mapping servers by using various software tools.

Prerequisites: GEOG 104, 380 or GEO381 or GEO484 or Web design experiences.

No Textbook required for this course. All lecture contents are available on the course website.

Lectures: The lectures will focus on the theories and principles behind the Internet mapping and distributed GIServices. There are two sessions for the lecture part. The first session (I) will focus on the theories and principles of Internet Mapping and distributed GIServices. The second session (II) will focus on the actual web applications. **Each student will select two weeks during the semester to introduce one Internet GIS (or mobile GIS) application per week (20 minutes per student)** and discuss the technology, usability, target users, and business models of the selected Internet GIS applications (details will be announced in the blackboard).

Lab Exercises: The lab exercises will focus on the practical installation and web design training for Internet mapping services. Students must attend each lab session. Lab exercises focus on the training of Internet Mapping skills and various Web Map Applications by using Web authoring software, and Web mapping packages, and programming languages.

Grading: Midterm exam 25%, Lab exercises 30%, Internet GIS (or Mobile GIS) demo 5%, Group project and Web design 30%, Class participation (On-line discussion) 10%.

Graduate students will have an additional assignment (literature review in their specialty areas with the Internet application). Additional 10% The literature review will ask the students to gather the following information:

1. Find out TWO web sites which focus on your own special areas (hydrology, urban geography, etc.), and write a 300 words paragraph to introduce EACH web site in HTML format. (Publish the writing on the personal Web page).
2. Write an essay about the impact of Internet on your own specialty group and identify the potential connections of the Internet applications with your own study area. (1000 words and publish the essay on the personal Web page).

(Graduate student assignment due day is **one week before the final group project presentation**).

Additional Readings: (electronic copies in the Blackboard reading folder).

1. Bush, V. (1945). As We May Think. *The Atlantic Monthly*, vol. July. Pp.101-108. URL:
2. Butler, Declan (2006). The web-wide world. *Nature*, 439(16). February 2006, pp. 776-778.
3. Gosling, J. & McGilton, H. (1996). *The Java Language Environment*, A White Paper. Sun Microsystems. URL: http://www.java.sun.com/docs/white/langenv/
   http://www.cs.sfu.ca/CC/365/mark/material/notes/Chap1/VBushArticle/
4. Limp, F. W. (2001). User needs drive web mapping product selection. *GEOWorld* Februry 2001. pp. 8-16. (Hand-out)
5. MacEachren, A. M. & Kraak, M. (2001). Research Challenges in Geovisualization, *Cartography and Geographic Information Science, Vol.28, No.1, 2001. URL:* http://www.geovista.psu.edu/icavis/publications.html
6. Open GIS Consortium, Inc. (OGC) (2000). *Open GIS Web Map Server Interface Implementation Specification (Revision 1.0.0)*. Wayland, Massachusetts: Open GIS Consortium, Inc. http://www.opengis.org/techno/specs.htm#implementation
7. Putz, Steve. (1994). Interactive Information Services Using World Wide Web Hypertext. In *Proceedings of the First International Conference on the World-Wide Web*, Geneva, Switzerland. URL: http://www94.web.cern.ch/WWW94/PrelimProcs.html
8. Tsou, M. H. (2011). Revisiting Web Cartography in the United States: the Rise of User-Centered Design. *Cartography and Geographic Information Science*, 38 (3), 249- 256.
9. Tsou, M.H. (2004). Integrated Mobile GIS and Wireless Internet Map Servers for Environmental Monitoring and Management. In special issue on the potential of web-based GIS, *Cartography and Geographic Information Science, 31(3), pp. 153-165.*

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.

WEEK		LECTURE	READING	LAB EXERCISE
1	18 Jan	Introduction	Butler.	**NO LAB first week.**
2	25 Jan	History of Internet and Web Mapping	Putz,	HTML Intro
3	01 Feb	Cartography and User Interface Design	MacEachren	Microsoft Express Web Tutorial
4	08 Feb	Software Architecture		Animated Pictures
5	15 Feb	Multimedia and Hypermedia **(Introduction to Group Project)**	Bush	Microsoft Express Web and Index maps
6	22 Feb	Software Solution Key Technologies	OpenGIS,	MapBox and Carto
7	01 Mar	Visualization/ HCI **Group Project Proposal Presentation)**	Tsou (2011)	ArcGIS online
8	08 Mar	Distributed component technology	Gosling	ESRI Story Maps and Group project websites
9	15 Mar	Mobile GIS and Wireless communication *(Distribute Mid-term Exam questions).*	Tsou (2004)	Camtasia (video production) and MapBox Tutorial.
10	22 Mar	**Mid-Term Exam 9:30 AM (Thursday)**		Leaflet Tutorial-1
11	**29 Mar**	**Spring Break (No Class)**		**No LAB**
12	05 Apr	Virtual Reality and 3D Cartography		Leaflet Tutorial-1
13	12 Apr	**AAG Meeting (No Class)**		**No LAB**
14	19 Apr	User Profile and Evaluation, AJAX, Semantic web, mashups, and cloud computing	Limp.	Web Log Analysis
15	26 Apr	The Future of GIServices **(Graduate Student Additional paper due)**		Group Project
16	03 May	**Group Project Presentations (SH 324) - as the Final Exam** (9:30 am-11:00pm)		
16	**08 May**	Email the Final Report by Noon (5/08) (mtsou@mail.sdsu.edu)		

GEOG 583 Internet Mapping and Distributed GIServices 2018 Spring
(30% of total course grade)

Group Project:

Two or three students will form an "Internet Mapping project team". Each group will submit one page proposal on **March 1, 2018** and choose a possible project topic. Each team will select a team coordinator, who will coordinate the work progress of your project. The proposal will list the following items in a single page:

- The title of your project,
- Members' names,
- Coordinator's name,
- One paragraph to explain your project (200-300 words), and
- Weekly schedules and individual assignments.

Each team will spend five minutes to introduce their project to the class on March 1, 2018.

Each team will give a brief group project progress report (two minutes) at the beginning of lecture each week (after March 1).

At the end of semester, each team will submit an "Internet Mapping project final report" in paper format and publish the result to group project web pages. **Each team will create a short 3 minutes video to introduce your group project.** The whole team members will present your project and video in front of the class as the final exam. **The final report presentation will be hold in May 3 from 9:30am - 11:00am in SAL lab.** Each team has 3 minutes for video and 12 minutes for presentation and 5 minutes for questions. (If you need to use the Powerpoint slide, upload the slide into Blackboard before your presentation.) The contents of your presentation should follow your group report. (Everyone are required to attend the presentation classes and sign-up your name). **The final report (paper format) is due on the May 8 (noon) by email to the instructor's email address (mtsou@mail.sdsu.edu)**

The Final report should include:

Group report (10-15 pages, double space, submit by each group) should include the following items:

- Team members
- Problem statement (why are you doing this project? why Internet mapping?)
- Literature review (other similar projects or fundamental theories – scientific journals or on-line resources)
- Database management and Internet Map Server setup (where do your data sets come from? Where do you put them on the Web and which version of Map Server do you use?)
- Results (introduce your web design and published data)
- Discussion

Link to the Group Project Video (3 minutes) using Camtasia Software.

Overview of your group project
Demo of the Web maps
Promote your web maps and get more users!

Group Project Grading:

Final presentation 20%, Web Design 40%, Group project report 25%, Video 15%.