

Original Syllabus

GEOG 319/658 Mapping and Analysis in the Cloud

Instructors: Terry Slocum and Xingong Li

Semester: Fall 2014

Class time: MW 3:00-4:15 PM

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Office Hours: Slocum (TR 9:15-10:45 AM and by Appt.)

Li (MW 1:15-2:45 PM and by Appt.)

Course Description

This course covers a broad range of approaches for visualizing and analyzing spatial data via the Web and associated cloud computing. Ultimately, the goal is to enable students to develop their own web mapping and analysis applications. An important element of this is the creation of map and analysis mashups, in which students utilize tools and data from multiple online sources to create web mapping and analysis applications.

Learning Outcomes

The goals of the course are to:

- 1) Learn how to use various programming languages to create Web mapping and analysis applications. We will focus on html and JavaScript.
- 2) Learn how to use application programming interfaces (APIs). We will focus on Google Map's API.
- 3) Learn how to create various web applications for visualizing spatial data.
- 4) Learn how to create various web applications for analyzing spatial data.

Students with Disabilities

The Academic Achievement and Access Center (AAAC) coordinates academic accommodations and services for all eligible KU students with disabilities. If you have a disability for which you wish to request accommodations and have not contacted the AAAC, please do so as soon as soon as possible. They are located in 22 Strong Hall and can be reached at 785-864-4064 (V/TTY). Information about their services can be found at <http://www.disability.ku.edu> . Please contact me privately in regard to your needs in this course.

Academic Misconduct

Copying, plagiarism, or other academic misconduct at any time during the semester will not be tolerated. Please be aware that the University's policy on academic misconduct can be found in Article II, Section 6 of the University Senate Rules and Regulations. See <http://policy.ku.edu/governance/USRR#art2sect6> .

Grading

Your grade in the course will be based on classroom attendance and participation (10 %), a set of approximately 10 exercises that will deal primarily with approaches for programming Web applications for visualizing and analyzing spatial data (70%), and a final project in which you develop a web-based application of your choosing (20%). A one- to two-page description of your plans for the final project will be due on November 7. As we approach the November 7 deadline, we will set up some class time to discuss potential topics for the final projects. Also feel free to schedule a meeting with the two of us to discuss plans for your final project. We will be expecting a more substantial project from those who are taking the class at the 658 level. Students will be required to make an in-class presentation of their final project during the last week of classes. The term paper and code for the project will be due on Thursday, December 18; a digital version of all materials will be required.

We will use the +/- grading system.

Storage for Data and Maps

Since we will be making use of the microcomputers in room 310 Lindley, we recommend that you acquire a USB flash drive (or other storage device) appropriate for backing up maps and data stored on these microcomputers.

Blackboard

We will use Blackboard for some things in the class (e.g., e-mail, distributing copies of course notes, and distributing grades). You can access blackboard at <http://www.blackboard.ku.edu> .

Required Text

Peterson, Michael P. 2014. *Mapping in the Cloud* . New York: The Guilford Press.

Potential Textbooks

Fu, Pinde and Sun, Jiulin. 2011. *Web GIS: Principles and Applications* . Redlands, CA: ESRI Press.

Muehlenhaus, Ian. 2014. *Web Cartography: Map Design for Interactive and Mobile Devices* . Boca Raton, FL: CRC Press.

Yang, Chaowei and Huang, Qunying. 2014. *Spatial Cloud Computing: A Practical Approach* . Boca Raton, FL: CRC Press.

Readings on reserve in Anschutz Library

Fu, Pinde and Sun, Jiulin. 2011. *Web GIS: Principles and Applications* . Redlands, CA: ESRI Press.

Muehlenhaus, Ian. 2014. *Web Cartography: Map Design for Interactive and Mobile Devices* . Boca Raton, FL: CRC Press.

Readings Available Electronically via KU Library

Yang, Chaowei and Huang, Qunying. 2014. *Spatial Cloud Computing: A Practical Approach* . Boca Raton, FL: CRC Press.

Readings Available via Blackboard

Battersby, Sarah E., Finn, Michael P., Usery, E. Lynn, and Yamamoto, Kristina H. 2014. Implications of Web Mercator and its use in online mapping. *Cartographica* 49(2):85-101.

Topics to be covered

Introto Maps and the Internet Peterson: Preface, Chapter 1

The Internet Map Landscape Peterson: Chapter 2

Exercise #1: Introduction to Image file types and HTML (Part a)

The Meaning of Mapping Peterson: Chapter 3

Creating a Map Gallery Peterson: Chapter 4

Exercise #1: Introduction to Image file types and HTML (Parts b and c)

History of Cartography Peterson: Chapter 5

The Online Street Map Peterson: Chapter 6

Exercise #2: Comparison of Map Service Providers

Map Scale and Abstraction Peterson: Chapter 7
Battersby et al. 2014

*Exercise #3: Map Scale, Map Projections, Data Classification,
and Linear Generalization*

Programming the Web with JavaScript Peterson: Chapter 8

Exercise #4: Creating a Basis for Visualization

Exercise #5: Some Basics for Analysis

Map Digitizing and GPS	Peterson: Chapter 9
Introducing Map Mashups	Peterson: Chapter 10
<i>Exercise #6: Introducing Map Mashups</i>	
Points and Point Data	Peterson: Chapter 11
Point Maps and Graduated Symbols	Peterson: Chapter 12
<i>Exercise #7: Creating Point and Graduated Symbol Maps</i>	
Line and Area Mashups	Peterson: Chapter 14
<i>Exercise #8: Creating Linear Feature Mashups</i>	
<i>Exercise #9: Creating Areal Feature Mashups</i>	
Map Layers and GIS	Peterson: Chapter 15
Map Layer Mashups	Peterson: Chapter 16
<i>Exercise #10: Creating Map Layer Mashups</i>	
Animated Mapping	Peterson: Chapters 21 and 22
<i>Exercise #11: Animated Mapping</i>	
Concepts in Online Mapping	Peterson: Chapter 13
Databases, MySQL, and PHP	Peterson: Chapter 17
Mapping from a Database	Peterson: Chapter 18
<i>Exercise #12: Mapping from a Database</i>	
Mobile Mapping	Peterson: Chapter 19
Local Mapping	Peterson: Chapter 20
<i>Exercise #13: Programs for Local Mapping</i>	
Analysis in the Cloud	Yang and Huang: Chapters 2, 3
<i>Exercise #14: Using the Google Earth Engine API</i>	
Virtual reality in the Cloud	Web Material
<i>Exercise #15: Experimenting with the Oculus VR headset</i>	