



## SSCI 589 – Cartography & Visualization (Section 35766D) Course Syllabus – Fall Semester 2014

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I am always available asynchronously via email. I am also available for synchronous chats via phone, audio or video most days and times *by prior arrangement* via email. Or we can meet in my Adobe Connect room. Just get in touch!

### *Course Scope and Purpose*

This course is designed to cover concepts and methods for mapping and visualizing geospatial phenomena. It is the elective course for both the GIST M.S. and Graduate Certificate programs. This is also a good course for those who are considering getting more seriously involved with cartography and visualization and who wish to first learn the underlying concepts and skills. In this course, you will gain an understanding of the fundamentals of cartography, the evolving role of maps in communication, and the ways in which various forms of spatial representations and visualizations can be performed using Esri’s ArcGIS ecosystem. We will cover six major topics:

*Cartographic fundamentals* – Map projections, graphic shapes, symbolization, classification, scale and generalization, and effective design (layout, color, and typography).

*Mapping discrete features* – Reference and thematic maps; and within the latter, the four basic subtypes of feature symbolization: choropleth, proportional symbol, dot density, and flow maps.

*Treatment of continuous surfaces* – Isarithmic analysis and terrain representation, including contour lines and hill-shading.

*Advanced cartographic techniques* – Cartographic techniques for labeling with Maplex, developing annotation feature class and symbolizing with feature class representations.

*Geovisualization* – Space-time and 3D visualization.

*Map Communication* – Cartographic thinking and communication.

### *Learning Outcomes*

This is a practical, hands-on course; when you have completed it, you will be able to:

- Develop and apply actionable knowledge of cartography and geovisualization.
- Design and construct maps for communicating map information to others.
- Make base information that provides geographic reference.
- Choose and arrange map elements for better cartographic communication.



- Choose and control labels, symbols and colors for best effect.
- Utilize a variety of thematic mapping and geovisualization techniques.

### ***Course Formats***

This is a graduate level course, so you should expect this class to be both academically robust and intellectually challenging. As graduate students you are expected to engage with the information you are learning and to explore the heady cauldron of ideas, opinion, and analysis that describe our collective effort to thoroughly interrogate the subject at hand. Learning arises from active engagement with the knowledge found in our reading materials and with one another. As in any graduate class, the instructor's role is that of a guide who keeps you on this path of discovery and you will find that you will learn much from your fellow classmates. The challenge for us is to replicate such an academic experience within the milieu of "online learning".

The course will be presented via Blackboard. There will be reading assignments, cartographic exercises, and a final project. The course will generally unfold on a weekly basis through a posted Assignment document that provides instructions on exercises, readings, and other work to be completed within the given time period. Weekly assignments will be posted on the Blackboard course site on Monday mornings. Assignments are due the following Monday, unless specified otherwise. Hands-on practical exercises will mainly use ArcGIS version 10.2.1, which is accessible via the GIST Servers.

We have several technologies that will facilitate our course work and our interactions, despite our dispersed locations. These include:

*Blackboard* – All course materials and correspondence will be posted on the course Blackboard site. As a registered student, you will find this course will show up in your available classes no later than 12:00 noon, PT on the first day of classes. It is here that the day-to-day flow of the course will be recorded.

*Discussion boards* – On the Blackboard site, we will post a number of discussion threads related to various course topics. These threads are very important in terms of providing support to each other while working on class exercises to share hints and helpful tips, as you would do in a classroom setting. I will check the discussion threads periodically and offer occasional comments. Please send me an email directly if you have a concern or question that requires my immediate attention.

*Individual meetings* – Adobe Connect is a browser-based service that facilitates synchronous, interactive sessions with voice/video and shared desktop capabilities between two or more people; this will be used for discussions of the final project and individual sessions, by arrangement.

*GIST server and tech support* – This course will utilize the GIST Servers to provide you with your own virtual desktop. You can access the GIST Server at: <https://gistonline.usc.edu>. If you are unable to connect to the server or experience any type of technical issues, send an email to GIST Tech Support at [gistsupport@dornsife.usc.edu](mailto:gistsupport@dornsife.usc.edu) and make sure to copy (cc) me on the email. GIST Tech Support is available Monday through Friday, 9:00 a.m. to 5:00 p.m. PT.



### ***Assessments***

Your grade in this class will be determined on the basis of several different assessment tools:

***Resume Assignment – 1 for a total of 1 point.*** The GIST Programs require all current students to post and maintain a public resume, short biography and recent photo on our shared GIST Student Community Blackboard site. With your permission, your photo and resume will be posted to the Spatial Sciences Institute website and your resume will be included in the GIST Resume Book. The latter is compiled annually and along, with our web presence, is used to promote our programs and more importantly, your skills, experience, and professional aspirations.

***Quizzes – 12 for a total of 22 points.*** Eleven quizzes will be administered throughout the semester and will afford each of you the opportunity to demonstrate your knowledge and understanding of weekly themes, which are shown in the Tentative Schedule on the last page of this syllabus.

***Discussion Forums – 6 for a total of 8 points.*** These will focus on varying combinations of theory and practice and anticipate that you will post a minimum of one message per forum and at least two replies to messages posted by your classmates in a forum at designated times throughout the semester.

***Map Exercises – 11 for a total of 51 points.*** Most weeks you will be expected to complete a map exercise after you complete the relevant quiz. To demonstrate that you have developed your own cartographic and mapping skills, you will turn in a copy of your maps and/or brief text answers. In addition, you will be asked to review your classmates' maps and provide them with feedback.

***Final Project – 4 components for a total of 18 points.*** The final project will be your opportunity to integrate all that you have learned in the semester by conducting an original mapping project. This mapping project will build upon the various map-making skills that you will develop during the semester. Your task is to construct your own map, which will require you to identify a topic, locate data, select a design, and apply your cartographic skills. To help facilitate this work, the final project will be broken up into four distinct components with their own points and deadlines as follows: (1) a written proposal (3 points); (2) an individual meeting (2 points); (3) a draft map and peer review comments (1 point); and (4) the final version of your map (12 points).

Careful planning and a serious, consistent commitment will be required for you to successfully navigate the various deliverables in this and other GIST courses. The table at the top of the next page summarizes the SSCI 589 course assignments and their point distribution:



Assignments	Number	Points Per Assignment	Total Points
Resume assignment	1	1	1
Quizzes	12	1-3	22
Discussion forums	6	1-2	8
Map exercises	11	2-12	51
Final project:			
Proposal	1	3	3
Meeting	1	2	2
Draft map	1	3	1
Final map	1	12	12
<b>Totals</b>	<b>32</b>	<b>-</b>	<b>100</b>

Grades in this and other GIST courses will use the standard USC grading criteria, as follows:

A	≥ 93 points	B-	80-82 points	D+	67-69 points
A-	90-92 points	C+	77-79 points	D	63-66 points
B+	87-89 points	C	73-76 points	D-	60-62 points
B	83-86 points	C-	70-72 points	F	< 60 points

And finally, it is important to note from the outset that: (1) late postings and assignments will be docked one grade and no grade will be given for postings or assignments turned in more than one week late; and (2) no written work will be accepted for grading after 5:00 p.m. PT on the last day of classes.

### Requirements

**Textbooks** – There are three required texts for this course. We encourage you to purchase these books early since you will need these materials from the opening day of class. These are available from the USC Bookstore or online outlets such Amazon.

- Slocum, T.A., McMaster, R.B., Kessler, F.C., & Howard, H.H. (2009) *Thematic Cartography and Geovisualization*, 3<sup>rd</sup> edition. Upper Saddle Creek, NJ, Pearson/Prentice-Hall.
- Monmonier, M. (1998) *How to Lie with Maps*, 2<sup>nd</sup> edition. Chicago, IL, University of Chicago Press.
- Allen, D.W. & Coffey, J.M. (2010) *GIS Tutorial 3: Advanced Workbook*, 1<sup>st</sup> edition. Redlands, CA, Esri Press.

**Readings** – To be posted to Blackboard under Course Documents:

- Batty, M., Hudson-Smith, A., Milton, R., & Crooks, A. (2010) Map mashups, Web 2 and the GIS revolution. *Annals of GIS* 16: 1-13.
- Brewer, C.A. (2005) *Designing Better Maps*. Redlands, CA, Esri Press (Chapter 5: Color Decisions for Mapping).
- Fontshop International (2010) *Meet Your Type: A Field Guide to Typography*. <http://www.fontshop.com/education> (last accessed 23 April 2014).



- Kimerling, A.J., Buckley, A.R., Muehrcke, P.C., and Muehrcke, J.O. (2012) *Map Use: Reading and Analysis*, 7<sup>th</sup> edition. Redlands, CA, Esri Press (Chapter 4: Grid Coordinate Systems).
- Kraak, M. (2008) Geovisualization and time: New opportunities for the space-time cube. In Dodge, M., McDerby, M., and Turner, M. (eds) *Geographic Visualization: Concepts, Tools and Applications*. New York, John Wiley and Sons: 293-306.
- Monmonier, M. (1990) Strategies for the visualization of geographic time-series data. *Cartographica* 27: 30-45.
- Shepherd, I.D.H. (2008) Travails in the third dimension: A critical evaluation of three-dimensional geographical visualization. In Dodge, M., McDerby, M., and Turner, M. (eds) *Geographic Visualization: Concepts, Tools and Applications*. New York, John Wiley and Sons: 199-222.
- Virrantaus, K., Fairbairn, D., and Kraak, M.-J. (2009) ICA research agenda on cartography and GIScience. *Cartographic Journal* 46: 63-75.
- Wood, J., Kirscheanbauer, S., Döllner, J., Lopes, A., Bodum, L. (2005) Using 3D in visualization. In Dykes, J., MacEachren, A., Kraak, M.-J. (eds) *Exploring Geovisualization*. Oxford, UK, Elsevier: 295-312.

**Technology** – ArcGIS is provided online via the GIST Server; hence, you do not need to install it on your own computer. Instead, every student must have the following technology requirements:

- A computer with a fast Internet connection.
- A functional webcam and a microphone for use whenever a presentation or meeting is scheduled.
- A modern web browser, Firefox recommended, to access the GIST Server

**Communications** – This is a distance learning course, so most of our interactions will be asynchronous (not at the same time). All materials to be handed in will be submitted via Blackboard. I will also create Blackboard discussion forums throughout the semester that we will use for the aforementioned assignments and so we can discuss comments and issues related to the course assignments, exercises, and projects as the need arises.

In addition, I will send via email through Blackboard any notices that are time sensitive. Please be sure that you read as soon as possible all email sent from Blackboard or from me. Check now to make sure that mail sent from both the USC blackboard accounts and my private domain (katsuhio@usc.edu) does not go into your junk mail!

While I am usually online and will probably respond to emails from students relatively quickly, I will endeavor to respond to all email within 24 hours of receipt, aiming for no more than 48 hours delay. In the rare case when I expect to be offline for more than 72 hours, I will post an announcement on the Blackboard site.

That said, it is each student's responsibility to stay informed about what is going on in our course. In addition to email about time-sensitive topics, any important announcements will be posted on the Announcement page in Blackboard. Be sure to check these each time you log onto Blackboard.

**Workload** – This is a four credit, one semester course. Students should expect to spend 10-15 hours per week completing the work in this course.



### ***Students with Disabilities***

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to an instructor as early in the semester as possible. DSP is located in STU 301 and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

### ***Statement on Academic Integrity***

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions can be found at: <http://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>.

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

### ***Important Administrative Dates***

- 8/25: Fall semester classes begin
- 9/1: Labor Day, university holiday
- 9/12: Last day to register and add classes
- 9/12: Last day to change enrollment option to Pass/No Pass or Audit
- 9/12: Last day to drop a class without a mark of "W" and receive a 100% refund
- 11/14: Last day to drop a class with a mark of W
- 11/26-29: Thanksgiving recess, university holiday
- 12/5: Fall semester classes end
- 12/18-1/11: Winter Recess



*Tentative Schedule*

Week #	Week Begins	Themes	Readings	Assignments Due Monday Following			Resume and Final Project Submission Weeks	
				Quizzes	Discussions	Map Exercises		
1	8/25	Map projections	Slo 8, 9 Mon 2	1	1			
2	9/2	Terrain representation generalization	Slo 6, 20 Mon 3	2	2	1	Resume	
3	9/8	Map elements	Slo 11, 12	3		2		
4	9/15	Typography	Slo 11 Fontshop	4		3		
5	9/22	Symbolization	Slo 5 Mon 2	5		4		
6	9/29	Principles of color	Slo 10, 14 Brewer 5	6		5		
7	10/6	Data classification & choropleth mapping	Slo 4, 14 Mon 10	7		6		
8	10/13	Proportional symbols & dot density mapping	Slo 17	8		7	Proposal	
9	10/20	Flow mapping	Slo 19	9		8	Project Meetings	
10	10/27	Cartogram	Slo-Ch.26 Dent	10		9		
11	11/3	Map Design for Web	TBA		3			
12	11/10	Space-time visualization	Kraak Monmonier	11	4	10	Project Draft	
13	11/17	3D visualization	Shepherd Wood	12	5	11		
14	11/24	Trends in cartography	Slo 26 Batty Virrantaus		6			
15	12/1						Project Final	
	12/5	End of Semester						