SSCI 201, Principles of Geodesign

Syllabus

Units: 4

Term Day Time: Spring 2021, Monday and Wednesday 2:00 – 3:50 p.m., Hybrid.

Location: CPA 154 & Online

Instructor: Leilei Duan, Ph.D.
Office: AHF B55J
Office Hours: Tuesday 8:00 – 9:00 a.m. PT and Thursday 1:00 - 2:00 p.m. PT, and by appointment via email.
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Library Help: Andy Rutkowski
Office: VKC 36B
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IT Help: Richard Tsung
Office: AHF 145D
Office Hours: By appointment
Contact Info: spatial_support@usc.edu, 213-821-4415

Course Scope and Purpose

Geodesign is a relatively new and emerging interdisciplinary field that draws key concepts and ideas from the fields of architecture, planning and the spatial sciences, and links and integrates them in new and exciting ways in hopes of improving the world around us by executing one project at a time. The field stresses engagement (including policymakers, experts, and the people of the place for example) and focuses on outcomes that may help us to solve some of the Earth's most difficult and enduring problems, such as population growth, lack of access to clean water, malnutrition, urbanization, ecosystem destruction and global warming, among others. These national and in many instances, global threats, can be tackled in numerous ways and the particular focus and value that geodesign affords is the ability to work at identifying and building solutions in an iterative fashion from the bottom up (i.e. the local and regional scales).

This course starts by tracing the foundations and guiding principles of geodesign and how the practice of geodesign can be invoked and deployed to improve the functioning of the Earth, with the engagement of the people of the place that would be affected. Three sets of concepts and ideas are reviewed next. The first set focuses on the role of space and time scales and place-making in society. The second set focuses on the role of observation and mapping in learning about the world around us and the role of storytelling and maps in communicating this knowledge across diverse audiences. The third and final set looks at how the past informs the present and future and how many of the drivers and processes that shape our everyday lives span multiple spatiotemporal scales.

The class then moves to an in-depth exploration of the framework for geodesign that Carl Steinitz published in 2012. The role of architecture and landscape architecture as the traditional home for place-making and design, of planning as a framework for combining collective and individual action across the Earth, and of the spatial sciences as a framework for acquiring, organizing, analyzing, modeling and communicating location-based information are emphasized. This framework is helpful in classifying the variations in values attributed to environmental amenities and conditions (by different stakeholders) or variations in disciplinary perspectives (by different scientific domains). This framework, in the broadest sense, envisages changing geography by design.

The class finishes up by reviewing several geodesign case studies from around the globe, and by doing so, lays out the foundation on which the upper division classes from architecture, planning and spatial sciences that comprise the Geodesign major are based.

Learning Outcomes

On completion of this course students will be able to:
- Synthesize the myriad ways in which places can be constructed, interpreted, and experienced by different people.
- Synthesize the principles of geodesign and how these can be used as a force for good in building healthy, livable, and sustainable communities.

- Analyze how urban and regional planning provides a framework for promoting civic engagement and collective action.
- Analyze how geographically referenced data can be gathered and organized to support a large number and variety of collaborative projects.
- Analyze how geospatial data can be analyzed, modeled and visualized to inform design and planning; and by doing so, support public participation and urban development.
- Analyze how form and function co-exist and evolve in urban and rural settings and how globalization connects near- and far-away places and actions.
- Synthesize how to integrate the content and research methods from architecture, urban and regional planning, spatial sciences, and other disciplines relevant to a particular situation.
- Synthesize the broader context in which the research issues and the practice of geodesign are positioned.

Prerequisite(s): None
Co-Requisite(s): None

Class Conduct

Harassment, sexual misconduct, interpersonal violence, and stalking are not tolerated by the university. All faculty and most staff are considered Responsible Employees by the university and must forward all information they receive about these types of situations to the Title IX Coordinator. The Title IX Coordinator is responsible for assisting students with supportive accommodations, including academic accommodations, as well as investigating these incidents if the reporting student wants an investigation. The Title IX office is also responsible for coordinating supportive measures for transgender and nonbinary students such as faculty notifications, and more. If you need supportive accommodations you may contact the Title IX Coordinator directly (titleix@usc.edu or 213-821-8298) without sharing any personal information with me. If you would like to speak with a confidential counselor, Relationship and Sexual Violence Prevention Services (RSVP) provides 24/7 confidential support for students (213-740-9355 (WELL); press 0 after hours)

Technological and Communication Requirements

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.
- An up-to-date web browser to access the Server

SSI Server and Tech Support – This course utilizes the SSI Server which is a virtual desktop giving access to many different professional software. If you are unable to connect to the server or

experience any type of technical issues, send an email using your USC account to SSI Tech Support at spatial_support@usc.edu, making sure to copy (cc) me on the email.

Communications – This is a hybrid learning course, so some of our interactions will be asynchronous (not at the same time). All materials to be handed in will be submitted via Blackboard. 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.

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. Do not ignore course email until the day before assignments are due. Also double check to be sure that email sent from the USC blackboard account does not go into your junk mail!

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

Required Readings and Supplementary Materials

Please acquire the texts listed below. All are available at the USC Bookstore. All other supplementary reading listed in the syllabus are available as electronic resources in USC Libraries or under the tab marked "Readings" on the course Blackboard.

The required textbooks for this course are:

- Benyus, J. (2002). *Biomimicry: Innovation Inspired by Nature.* New York, NY: Random Books.
- Jacobs, J. (1961). *The Death and Life of Great American Cities.* New York, NY: Random House (Vintage Books edition, 1992).
- Leopold, A. (1949). *A Sand County Almanac: And Sketches Here and There.* New York, NY: Oxford University Press.
- McHarg, I. (1969). *Design with Nature.* New York, NY: Doubleday Books.
- Speck, J. (2012). *Walkable City.* New York, NY: North Point Press.
- Steinitz, C. (2012). *A Framework for Geodesign: Changing Geography by Design.* Redlands, CA: Esri Press.
- Wilson, E. O. (2016). *Half-Earth: Our Planet's Fight for Life.* United States: Liveright.

Supplementary readings for this course are:

- Bandarin, F., & van Oers R. (Eds.) (2014). *Reconnecting the City: The Historic Urban Landscape Approach and the Future of Urban Heritage.* Oxford, UK: Wiley-Blackwell.
- Bassett, T.J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum, 48,* 42-53.

- Cochran, G., & Harpending, H. (2009). *The 10,000 year explosion: How civilization accelerated human evolution*. Basic Books.

- Duany, A., Plater-Zyberk, E., & Speck, J. (2000). *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream.* New York, NY: North Point Press.

- Forman, R. 1996. *Land Mosiacs.* Cambridge, MA: Harvard University Press.

- Goodchild, M.F. (2010). Towards Geodesign: Repurposing Cartography and GIS? *Cartographic Perspectives, 66,* 7-22.

- Hise, G., & Deverell, W. (2000). *Eden by Design: The 1930 Olmsted-Bartholomew Plan for the Los Angeles Region.* Berkeley, CA: University of California Press.

- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy: The human development sequence*. Cambridge University Press.

- Kim, M. (2017). Teaching coastal resilience using geodesign: A study of Virginia Beach. *Journal of Digital Landscape Architecture,* 279-286.

- Lynch, K. (1960). *The Image of the City*. United Kingdom: Harvard University Press.

- Reisner, M. (1986). *Cadillac Desert*. New York, NY: Viking Press.

- Saunders, W. (2012). *Designed Ecologies: The Landscape Architecture of Kongjian Yu*. Berlin, Germany: Birkhäuser.

- Sterman, J.D. (2002). All models are wrong: Reflections on becoming a systems scientist. *System Dynamics Review, 18*(4), 501-531.

- Waltham, T., & Sholji, I. (2001). The demise of the Aral Sea: An environmental disaster. *Geology Today, 17*(6), 218-228

- World Wildlife Foundation, *Effects of Climate Change*. Retrieved from https://www.worldwildlife.org/threats/effects-of-climate-change

Description and Assessment of Assignments

Exercises

In addition to regular attendance and class participation, there is a set of four in-class exercises spread across the semester. These exercises will use pencils and (tracing) paper and will be designed to introduce you to the concepts and tools of geodesign as well as to give you practical experience in implementing these concepts and tools to explore various problems (and solutions) within the framework of geodesign. The primary goal of the exercises is to enable students to understand the value of spatial knowledge, maps, and the spatial representation of natural and human phenomena in design.

Reports

Throughout the semester, students will also produce five summaries of books or articles on foundations of geodesign used in class and how the readings have influenced their view of the role that planning, science and design might play in solving some of the Earth's most serious

and enduring challenges. Students should use these short writing assignments strategically to explore existing interests and build background knowledge for the story map project.

Story Map

The final project in this course is a story map. Story maps tell about places, issues, and trends by enriching digital maps with content like various kinds of graphs, text, photographs, video, and audio. The underlying data often depict the coupling of social and natural systems. These may be things like wetland areas, land cover, and census data, and may also include live data streams such as temperature, precipitation, and traffic. They often present scientific data and analysis, but they are mainly designed for the general public and do not require their users to have special knowledge or skills with the use of Geographic Information Systems (GIS) for example.

Story maps are increasingly used in geodesign and are an important tool to describe the challenges faced in various parts of the world and pathways toward sustainability and improved human well-being. For example, you can see an interactive story map that describes land use footprints of megacities here: https://storymaps.arcgis.com/stories/a900831b442e43c79cf9eeb399d5440f. This story map was created as part of the Smithsonian's series on *Living in the Anthropocene: The Age of Humans*. Another example shows the state of the global climate in 2018 (see: https://wmo.maps.arcgis.com/apps/Cascade/index.html?appid=855267a7dd394825aa8e9025e024f163).

In this course, you will create a story map that is focused on one of the selected sites in the great Los Angeles area that are suitable for geodesign intervention. Students will be divided into small teams (2-4 students per team) and these teams will prepare presentations that offer a critical review of the workflow and the spatial concepts and tools that were used to synthesize scientific understanding on the one hand and to prepare and communicate one or more plans or designs for addressing the problem or challenge on the other hand. These story maps will be expected to integrate data on social and natural systems around the chosen geodesign case study. These story maps will also integrate scientific data like the examples above but their primary focus will be the use of geodesign as a force for good at local or regional scales.

Please note as well that some of the story maps you may see on the web are simply a montage of geotagged photographs and that your story map will be much more than this. It may have maps or photos for context, but it must be primarily an analytical report that includes writing in pop-up windows and sidebars. It will use visualization of data or models, like in the examples linked above, to communicate the underlying principles of geodesign and how they were brought together and used in an attempt to solve the problem at hand.

Exams and Other Policies

The final exam is closed book and will include content learned in course readings, lectures, and in-class exercises. **No make-up opportunities will be offered for missed exams or in-class exercises,** so mark the appropriate dates on your calendars! If you have a legitimate conflict,

speak with the instructor as soon as possible. Also, note that there is **no credit for late assignments.**

Absences from class sessions must be requested by sending an email to the instructor. Excused absences from class sessions will be granted only for valid reasons; please notify us of the reason for your absence in your email.

Grading Breakdown

The following table shows the breakdown of the assignments and their contributions to the final grade. The emphasis is on regularly completing a number of short assignments as well as solid performance on the story map presentation and the final examination. Assignments must be submitted as noted, typically on the course Blackboard (Bb) site.

Assessment	Number	Points Each	Total Points (% of Grade)
Exercises (Submit in class & on Bb)	4	6	24
Reports (Submit in class & on Bb)	5	6	30
Final Project: Story Map (Submit URL to Bb) and give oral report	1	16	16
Final Exam (Closed Book)	1	30	30
Total	12	-	100

Course Schedule: A Weekly Breakdown

	Topic	Readings and Assignments	Deliverables/Due Dates
Week 1			
1/18*	University holiday*	Leopold (1949)	
1/20	Introduction to Course	Leopold (1949) Report #1	
Week 2			
1/25	What is Geodesign – General Concept		
1/27	Sketching the Natural World	Cochran & Harpending (2009, Ch. 1-2)	Report #1 is due in Bb by 2:00 p.m. on Wednesday, 1/27
Week 3			

		Topic	Readings and Assignments	Deliverables/Due Dates
2/1		Charting the Evolution of Human Civilization	Inglehart & Welzel (2005) p.15-47	
2/3		Mapping Modernization and Prosperity	Articles provided on Blackboard. Report #2	
Week 4				
2/8		The Ascent of Globalization and City Regions	Articles provided on Blackboard; Steinitz (2012, Ch. 1 & 2)	
2/10		Understanding Imminent threats and challenges	Jacobs (1961)	Report #2 is due in Bb by 2:00 p.m. on Wednesday, 2/10
Week 5				
2/15*		University holiday*	Jacobs (1961), McHarg (1969) Exercise #1	
2/17		What is (Not) Geodesign – In Depth Understanding	McHarg (1969) Exercise #2	
Week 6				
2/22		Antecedents of Geodesign	Forman (1996) Exercise #3	Exercise #1 is due in Bb by 2:00 p.m. on Monday, 2/22
2/24		Maps and Map Overlay	Steinitz (2012, Ch. 3 & 4), Articles provided on Blackboard	
Week 7				
3/1		Understanding the Design with Nature	Steinitz (2012, Ch. 5 & 6); Articles provided on Blackboard.	
3/3		The People of the Place	Steinitz (2012, Ch. 7, 8, & 9) Report #3	Exercise #2 is due in Bb by 2:00 p.m. on Wednesday, 3/3

	Topic	Readings and Assignments	Deliverables/Due Dates
Week 8			
3/8	Steinitz' Geodesign Framework	Articles provided on Blackboard.	
3/10	Geodesign Exercise #3	Articles provided on Blackboard.	
Week 9			
3/15	Geodesign Exercise #4	Articles provided on Blackboard.	
3/17	Global Geodesign Challenges – Climate Change	Articles provided on Blackboard.	Report #3 is due in Bb by 2:00 p.m. on Wednesday, 3/17
Week 10			
3/22	Global Geodesign Challenges – Population Growth and Resource Scarcity	Articles provided on Blackboard.	
3/24	Global Geodesign Challenges – Biodiversity	Articles provided on Blackboard.	Exercise #3 due in Bb by 2:00 p.m. on Wednesday, 3/24
Week 11			
3/29	Regional Geodesign Challenges – Public Health	Articles provided on Blackboard. Report #4	
3/31	Regional Geodesign Challenges – Designed Ecology	Saunders (2012)	Exercise #4 due in Bb by 2:00 p.m. on Wednesday, 3/31
Week 12			
4/5	Regional Geodesign Challenges – Smart City		
4/7	Regional Geodesign Challenges – Walkable City	Speck (2012) Report #5	Report #4 is due in Bb by 2:00 p.m. on Wednesday, 4/7
Week 13			

	Topic	Readings and Assignments	Deliverables/Due Dates
4/12	Local Geodesign Challenges – Drought	Articles provided on Blackboard.	
4/14	Local Geodesign Challenges – Homelessness	Articles provided on Blackboard.	Report #5 is due in Bb by 2:00 p.m. on Wednesday, 4/14
Week 14			
4/19	Geodesign Innovations	Benyus (2002)	
4/21	Field trip to Downtown LA		
Week 15			
4/26	Student Story Map Presentations		Story Map Due at Class and Submit to Bb by 2:00 p.m. on Monday, 4/26
4/28	Student Story Map Presentations		
4/30 – 5/4 Study Days			
5/10	**Final Examination (2 - 4 p.m.) (Closed Book online)**		

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems

Counseling and Mental Health– (213) 740-9355 – 24/7 on call
engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline – 1 (800) 273-8255 – 24/7 on call
 www.suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-9355(WELL), press "0" after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) – (213) 740-5086 |Title IX Compliance – (213) 821-8298
equity.usc.edu, titleix.usc.edu
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment– (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs – (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention – (213) 821-4710
uscsa.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC – (213) 740-2101
diversity.usc.edu
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety – - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu
Non-emergency assistance or information.

Resources for Online Students

The Course Blackboard page and the GIST Community Blackboard page have many resources available for distance students enrolled in our graduate programs. In addition, all registered students can access electronic library resources through the link https://libraries.usc.edu/. Also, the USC Libraries have many important resources available for distance students through the link: https://libraries.usc.edu/faculty-students/distance-learners. These include instructional videos, remote access to university resources, and other key contact information for distance students.