

**SSCI 314, Comparative Sustainability Theory and Practice for Geodesign**

*Syllabus*

**Units:** 2

**Term Day Time:** Spring 2022 – Wednesdays –9-10:50 a.m.

**Location:** TBD/TBA

**Instructor:** Robert O. Vos, Ph.D., GISP

**Office:** AHF B57B

**Regular Office Hours:** Mondays and Wednesdays 10 a.m.-11 a.m. Also available by appointment via email.

**Contact Info:** vos@usc.edu, 213-821-1311,  
<https://usc.zoom.us/my/vosusc>

**Library Help:** Andy Rutkowski

**Office:** VKC 36B

**Office Hours:** Tuesdays 10 a.m. – 12 pm; Also available by appointment via email.

**Contact Info:** arutkows@usc.edu, Zoom info on Blackboard

**IT Help:** Richard Tsung

**Office:** AHF 55E

**Office Hours:** By appointment

**Contact Info:** spatial\_support@usc.edu, 213-821-4415

## **Course Description**

This course introduces the comparative theory and practice of sustainability and its important role in geodesign. Sustainability is among the most pressing scientific and social challenges of our time and one of the major goals for the successful practice of geodesign. In spite of official attention from the United Nations in the late 1980's and several rounds of sustainable development goals since then, local examples of progress have not yet summed to a global equilibrium for planetary ecosystems. Global climate change, ocean degradation, deforestation, habitat loss, and species endangerment continue nearly unabated. Using sustainability theory, this course comparatively interrogates local examples to uncover what hinders efforts and discover what types of geodesign practice in which sorts of places may most rapidly bring closer the goal of a sustainable global environment.

Although much of the theory of sustainability is global, and in some sense thought to be universal, the opportunities to realize sustainability at local levels vary greatly due to divergent histories, cultures, languages, physical geographies, infrastructures, economic resources, and systems of governance. Indeed, because places can be constructed and interpreted in a myriad of ways by different people, the foregoing list is hardly exclusive of the sorts of divergences students may find when investigating specific places.

This course will largely, but not exclusively, focus on cities. In 2008, an important global threshold was reached, with over 50% of people living in cities. According to UN forecasts, by 2050 70% of the Earth's growing population will be living in urban areas. Yet, as students may find with many aspects of this course, this historic global milestone elides significant local differences in the rate, timing, and general social and physical nature of urbanization.

### ***Learning Objectives***

Upon successful completion of this course, a student will be able to:

- Describe and apply major elements of sustainability theory to urban places;
- Engage with the history and socio-cultural frameworks of places different from ones they are accustomed to;
- Distinguish globally applicable theory from place-specific practice;
- Set and advocate for priorities for geodesign practice;
- Evaluate and choose among geodesign methods in response to priorities for sustainability practice in geodesign; and
- Demonstrate an international awareness of the problems and solutions for sustainability with respect for the diversity of places, individual human rights, and the needs of other species.

Students may vary in their competency levels on these abilities. You can expect to acquire these abilities only if you honor all course policies, attend classes regularly, complete all assigned work in good faith and on time, and meet all other course expectations of you as a student.

**Prerequisite(s):** None

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

**Recommended Preparation:** SSCI 201: Principles of Geodesign or SSCI 165Lgw: Sustainability Science in the City.

## **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](mailto: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)

**COVID-19 safety policy** -- Students are expected to comply with all aspects of USC's COVID-19 policy including, but not limited to, vaccination, indoor mask mandate, and daily TrojanCheck. Failure to do so may result in removal from the class and referral to Student Judicial Affairs and Community Standards. Students are recommended to keep safe physical distancing, whenever possible, to prevent any possible transmission. Please contact your instructor if you have any safety concerns.

## **Course Structure**

The first four weeks of the course offer an immersion in sustainability theory and its role in geodesign. At the end of this first course module, each student will work with the instructor and classmates to choose a particular urban place in which to investigate and establish priorities for sustainable geodesign practice. Each student will choose a different place to study, and the aim is to include, across the students in the class, a wide variety of places at various scales around the world. For lectures throughout the course, the instructor will include examples from cities in the United States, but students will investigate urban places outside the United States.

The second and third modules of the course will cover geodesign practice in physical and social systems of cities. A series of exercises will be provided in homework packets for the second and third module of the course. Students will prepare the exercises before the class session in which they are indicated and will contribute to discussions based on the preparation of the exercises. The exercises will culminate in the second and third project reports at the end of the second and third modules of the course.

The course ends with a discussion of governance and scale, comparing successes and failures at regional planning and governance. The various exercises and reports will culminate in a final story map project that will be presented at the final class session and become an important part of each student's electronic portfolio.

## Required Readings and Supplementary Materials

All of the supplementary readings listed below are available online through USC Libraries or under the tab marked "Readings" on the course Blackboard.

Required Textbook:

- Brunn, S.D., J.K. Graybill, M. Hays-Mitchell, and D. Zeigler (Eds). 2015. *Cities of the World: Regional Patterns and Urban Environments*, 7<sup>th</sup> Edition. New York: Rowman and Littlefield (ISBN: 978-1538126349) (Available at the USC Bookstore).

Supplemental readings:

- Angel, S. 2011. *Making room for a planet of cities*. Policy Focus Report (PF027). Cambridge, MA: Lincoln Institute of Land Policy.
- Beatley, T. 2020. A global shift to biophilic cities: The vision and emerging practice for the future. In B. Hagen and K.D. Pijawka (Eds.), *Sustainability for the 21<sup>st</sup> Century: Pathways, Programs, and Policies*, 3<sup>rd</sup> Edition (pp. 303-328). Dubuque, IA: Kendall Hunt.
- Dur, F., T. Yigitcanlar, and J. Bunker. 2014. A spatial-indexing model for measuring neighbourhood-level land-use and transport integration. *Environment and Planning B: Urban Analytics and City Science* 41(5), 792-812.
- Hettinga, S., P. Nijkamp, and H. Scholten. 2018. A multi-stakeholder decision support system for local neighborhood energy planning. *Energy Policy*, 277-288.
- Huang, L., W. Xiang, J. Wu, C. Traxler, and J. Huang. 2019. Integrating GeoDesign with Landscape Sustainability Science. *Sustainability* 11, 833.
- Hutton, G. and C. Chase. 2016. The knowledge base for achieving the sustainable development goal targets on water supply, sanitation and hygiene. *International Journal of Environmental Research and Public Health* 13, 536.
- Meenar, M.R. 2019. Integrating placemaking concepts into green stormwater infrastructure design in the City of Philadelphia. *Environmental Practice* 21(1), 4-19.
- Monteiro, L.D.O., A.C.M. Moura, C.M. Zyngier, I.S. de Sena, and P.L. de Paula. 2018. Geodesign facing the urgency of reducing poverty: The cases of Belo Horizonte. *Disegnarecon* 11(20), 6.1-6.14.
- Neuman, M. and W. Zonneveld. 2018. The resurgence of regional design. *European Planning Studies* 26(7), 1297-1311.
- Nyerges, T., H. Ballal, C. Steinitz, T. Canfield, M. Roderick, J. Ritzman, and W. Thanatemanerat. 2016. Geodesign dynamics for sustainable urban watershed development. *Sustainable Cities and Society* 25(August), 13-24.
- Purvis, B., Y. Mao, and D. Robinson. 2019. Three pillars of sustainability: in search of conceptual origins. *Sustainability Science* 14, 681-695.

- Ross, C. (Ed.). 2009. Megaregions: planning for global competitiveness. Washington, D.C.: Island Press.
- Ruddell, D., A. Brazel, W. Chow, and A. Middel. 2020. The urban heat island effect and sustainability science: Causes, impacts, and solutions. In B. Hagen and K.D. Pijawka (Eds.), *Sustainability for the 21<sup>st</sup> Century: Pathways, Programs, and Policies*, 3<sup>rd</sup> Edition (pp. 281-301). Dubuque, IA: Kendall Hunt.
- Soltani, A. and E. Sharifi. 2012. A case study of sustainable urban planning principles in Curitiba (Brazil) and their applicability in Shiraz (Iran). *International Journal of Development and Sustainability* 1(2), 120-134.
- Thomas, R., D. Pojani, S. Lenferink, L. Bertolini, D. Stead, and E. van der Krabben. 2018. Is transit-oriented development (TOD) an internationally transferable policy concept? *Regional Studies* 52(9), 1201-1213.
- Webster, D., F. Zhang, and J. Cai. 2017. China's pursuit: smart sustainable urban environments. In B. Hagen and K.D. Pijawka (Eds.), *Sustainability for the 21<sup>st</sup> Century: Pathways, Programs, and Policies*, 2<sup>nd</sup> Edition (pp. 307-331). Dubuque, IA: Kendall Hunt.
- Wu, C. and Y. Chiang. 2018. A geodesign framework procedure for developing flood resilient city. *Habitat International* 75(May), 78-89.
- Yang, P.P., S.J. Quan. D. Castro-Lacoture, and B.J. Stuart. Geodesign method for managing a close-loop urban system through algae cultivation. *Applied Energy* 231(December), 1372-1382.

## Description and Valuation of Assessments

For this two-unit course, students will participate in 30 hours in the classroom and can expect 60 hours of outside class work over the course of the semester.

This course includes a diversity of assessments that allow students to show mastery of the material in a variety of ways. The different types of assessments are described below and their point value to final grades are listed in the following Grading Breakdown section.

### Exercises

A set of 8 exercises is included in Modules 2 and 3 of the course. The “hands-on” tasks that comprise these exercises will introduce the tools of scientific inquiry and give students practical experience in implementing these tools within geodesign practice. Students must complete 5 out of these 8 exercises. Students may choose among the 8 exercises, but all must complete the first exercise on urban footprints. If students complete more than 5, the instructor will use the highest-scoring 5 exercises in computing the final grade. The exercises are different from the lecture content but will be an important basis for class discussion at each class meeting during modules 2 and 3.

### Projects

Two projects are spread across the course. The first project relates to initial research on and establishing the urban place that the student will work on during the exercises in the course.

The second compiles and frames the work to be done for the final story map project as a written proposal.

### ***Final Story Map Project***

The final project will set priorities and identify methods for geodesign practice in the urban place that a student has studied throughout the semester. The story map format will allow for students to use data visualizations to put forward a compelling case for geodesign work towards sustainability in a specific place. The story maps will be a basis for lively discussion at the final class session and will be a valuable part of the student's electronic portfolio.

### ***Class participation***

This class is taught in a seminar style and class participation is both expected and assessed. Class participation includes assigned short presentations of readings and raising questions and issues for clarification during lectures and discussions led by the instructor or guest lecturers. Students who stay current with the reading will be best positioned to participate. Assessment of participation will be based on feedback on assigned short presentations and attendance records.

### ***Final Exam and Other Policies***

The final exam is closed book. This exam will cover content learned during lecture as well as in the course readings.

**No make-up opportunities will be offered for the final exam**, so mark the appropriate date on your calendar! If you have a legitimate conflict, per the USC policy on Final Exam Scheduling, speak with me as soon as possible. In addition, please note that there is **no credit for late assignments**.

### **Grading Breakdown**

The table below shows the breakdown of the assessments and their weight in the final grade. The emphasis is on regularly completing a number of projects as well as solid performance on the final examination.

Assessment	Number	Points Each	Total Points (% of Grade)
Projects	2	10	20
Exercises	5 of 8	5	25
Final Story Map Project	1	25	25
Final Exam	1	20	20
Class Participation	1	10	10
Totals	10	--	100

## Schedule

Date	Topics	Readings	Deliverables/Due Dates
(Note: This course will likely include participation from faculty and perhaps students from abroad via a high-speed Internet conferencing equipped classroom. The specific faculty and topics for Guest Lectures indicated below are subject to change depending on scheduling and availability.)			
<b>Module 1   Introduction to Sustainability Theory in Geodesign</b>			
<b>Week 1</b>			
1/12	Introduction: Defining Sustainability	Vos (2007) Brunn et al. (2016) Chapter 1 Soltani and Sharifi (2012) Purvis et al. (2019) (Recommended)	
<b>Week 2*</b>			
1/19	Operationalizing Sustainability in Geodesign  Guest Lecture: Dr. Ben Purvis, University of Sheffield	Huang et al. (2019) Brunn et al. (2016) Chapter 13	
<b>Week 3</b>			
1/26	Trends and Historical Overviews	Brunn et al. (2016) <i>Historical Perspectives</i> in Chapters 2-12	
<b>Week 4</b>			
2/2	Comparative Contexts of Practice	Webster et al. (2017) Brunn et al. (2016) (individual chapters to be assigned)	First Project Report

<b>Module 2   Comparison of Physical Systems in Cities</b>			
<b>Week 5</b>			
2/9	Landscapes: Urban Form and Urban Footprint  Guest Lecture: Dr. Jeffery Sellers, USC	Angel (2011) & Also view: <a href="http://www.atlasofurbanexpansion.org">http://www.atlasofurbanexpansion.org</a>	Urban Footprint Exercise
<b>Week 6</b>			
2/16	The “Brown” Agenda: WaSH and Air Quality	Hutton and Chase (2016)	Environmental Health Exercise
<b>Week 7</b>			
2/23	Urban Climate: Heat Islands and Resilience to Climate Change		Urban Climate Exercise
<b>Week 8</b>			
3/2	Water: Rivers and Coastal Zones  Guest Lectures on <i>Sponge Cities</i> with Lihua Li (PKU) and <i>Room for the Water</i> with Niels van Manen, Virjie University (VU)	Nyerges et al. (2016)	River or Port Exercise
<b>Week 9</b>			
3/9	Biophilic Cities and Geodesign for Ecological Security in China  Guest Lecture: Sisi Wang, Peking University (PKU)	Beatley (2020)	Biophilic Cities Exercise
Spring Break 3/13-3/20			

<b>Module 3   Comparison of Social Systems in Cities</b>			
<b>Week 10</b>			
3/23	Placemaking: Culture and the Built Environment  Guest Lectures on Adapting Historic Landscapes with Niels Van Manen (VU) and Zhao Xuanxi (PKU)	Meenar (2019)	Second Project Report Due
<b>Week 11</b>			
3/30	Transportation Systems: Goods Movement and Transit	Thomas et al. (2018) Dur et al. (2014)	Transportation Systems Exercise
<b>Week 12</b>			
4/6	Housing: Quality, Affordability, and Mapping  Guest Lecture: Dr. Niels Van Manen, VU on Redevelopment of the Rotterdam Port	Monteiro et al. (2018)	Housing Exercise
<b>Week 13</b>			
4/13	Industrial Systems: Hard and Soft Infrastructures of Energy  Guest Lecture: Sanne Hettinga, VU on Geodesign for Green Energy in Amsterdam	Perry (2018)	Third Project Report

<b>Module 4   Governance and Scale</b>			
<b>Week 14</b>			
4/20	New Regionalism in Comparative Perspective and the Rise of Megaregions	Neumann and Zonneveld (2018) Ross (2016)	
<b>Week 15</b>			
4/27	Concluding Thoughts: How does variation in places inform sustainability theory?	Story Map Project Presentations	Final Story Map Project Due
<b>Final Examination</b>			
<b>Date and Time as designated in the Schedule of Classes; Location TBD; Closed Book</b>			

## 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](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

### *Students and Disability Accommodations*

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](http://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu)

## **Support Systems**

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.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*

[suicidepreventionlifeline.org](http://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](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086*

[eetix.usc.edu](http://eetix.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](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

*The Office of Student Accessibility Services (OSAS) - (213) 740-0776*

[osas.usc.edu](http://osas.usc.edu)

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity, Equity, and Inclusion - (213) 740-2101*

[diversity.usc.edu](http://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](https://dps.usc.edu), [emergency.usc.edu](https://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](https://dps.usc.edu)

Non-emergency assistance or information.

*Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)*  
[ombuds.usc.edu](https://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

*Occupational Therapy Faculty Practice - (323) 442-3340 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)*  
[chan.usc.edu/otfp](https://chan.usc.edu/otfp)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.