

SSCI 412, Geodesign Practicum

Syllabus

Units: 4

Term Day Time: Spring, 2021, Monday 2:00-5:50 pm

Location: GFS 218 and Online

Instructor: Darren Ruddell, Ph.D. GISP

Office: AHF B57F

Office Hours: Mondays, 11 am-12 pm and
Thursdays, 8-9 am PT, and by appointment via email.

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contact page on Blackboard for Zoom room

Library Help: Andy Rutkowski

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Thursdays, 4:30-5:30 pm PT

Contact Info: arutkows@usc.edu, 213-740-6390,
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IT Help: Richard Tsung

Office: AHF 146

Hours of Service: By appointment

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4415

Course Description

SSCI 412 is required for Geodesign majors and serves as the capstone course in the Geodesign curriculum. The aim of SSCI 412 is to provide students with a learning experience that requires them to apply critical and spatial thinking skills to effectively manage and deploy appropriate geospatial technologies to undertake a self-directed urban design challenge while producing spatially-informed and scientifically sound results. Students will synthesize technical comprehension of geospatial technologies with appropriate bodies of literature to investigate a local urban design challenge and propose a design alternative. Students will engage Los Angeles as a living laboratory by participating in field trips and/or meetings with subject matter experts to examine and discuss design challenges, constraints, and opportunities.

The 2021 Geodesign practicum examines Covid-19 and the built environment. The impact of Covid-19 has presented swift, widespread, and unprecedented challenges to almost every aspect of life including human health, culture, the economy, education systems, transportation systems, among many others with devastating impacts from local to global scales. The built environment represents a unique and important context to study and understand the cause of an outbreak as well as develop built solutions that can be deployed to help avoid future pandemics. Geodesign offers a research framework and diverse set of tools that can be used to propose, vet, and evaluate alternative design scenarios to help Los Angeles or any city implement a series of rapid, thoughtful, and integrated set of solutions to help stem future infectious disease outbreaks.

The outline that follows provides the structure and rules that should be necessary to embark on this ambitious 15-week project. For a successful project, it is important that:

- Students operate as a professional team with support and guidance of instructor;
- All parties develop a high level of trust and spirit of collaboration;
- Students and faculty are responsive to clients while conducting independent research;
- Communication between parties is professional and frequent; and
- Students feel comfortable to make decisions, make mistakes, and learn from the experience.

Learning Outcomes

On completion of this course, students should be able to:

- Organize and execute a series of geographic data acquisition, analysis, and mapping tasks to address one or more real-world challenge.
- Demonstrate an ability to work in a team.
- Apply geospatial technologies and spatial reasoning skills to a course research project.
- Recommend a spatially-informed and data-driven design intervention on a predetermined urban design challenge.

Prerequisite(s): SSCI 382

Co-Requisite (s): None

Concurrent Enrollment: None

Recommended Preparation: Student enrolled in the Geodesign major or Spatial Studies minor

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).

Course Notes

This course serves as a capstone class for students studying geodesign studies at USC where students work in one or more small groups on a large geospatial project of their choice throughout the entire semester. Students are taught a variety of skills related to project management, geospatial data handling, presenting, and research and writing. Students complete a series of assignments that are designed to evaluate their proficiency with the use of these various skills to build a series of geospatial project deliverables.

Technological Proficiency and Hardware/Software Required

The modeling software and geospatial data required for course assignments will be accessed using computing resources provided by the Spatial Sciences Institute.

Required Readings

The required textbooks for this course are:

- Berenson, K. 2018. *Managing Your Research Data and Documentation*. Washington, DC, American Psychological Association.
- McHarg, I. 1969. *Design with Nature*. New York, NY, Natural History Press.
- Steinitz, C. 2012. *A Framework for Geodesign*. Redlands, CA, Esri Press.

Project Overview and Requirements

Academic Units and Grading

Students will work in groups but will be graded separately. It is *not* required that all students in a project receive the same grade.

At the end of the semester, students are required to complete self-evaluations and peer evaluations and submit them to their instructor by the last day of classes. The faculty will consider these evaluations in assigning grades.

Grades will not be assigned until the group has submitted and the instructor has approved the final report.

Student Time Commitment

Students should expect to devote, on average, 10 hours a week to the Group Project. This time includes class meeting time and field trips as appropriate for each project. Progress on Group Projects should be evenly allocated over the semester to avoid excess workload during the last few weeks.

Required Work Products

The required work products for each group include:

- A literature review and project proposal
- Proposal presentation
- Draft report
- Final report, including an executive summary
- Presentation of the final report
- Peer evaluations

Authorship/Ownership

Each member of the group, along with the faculty instructor for that group, is an equal owner of the data collected during the project. That means that each member of the group can use the data even after the project has ended. Papers, posters, presentations, and other derivative products that arise from the data collected during the project must acknowledge every member of the group in a manner that is appropriate to the group's contribution to the derivative product.

Data Distribution

Datasets and processed datasets that may have been obtained/derived during your work may be licensed or copyrighted or confidential. You should *not* make them available to third parties without authorization from your faculty advisor *and* the original source of data. Also, data should not be placed online unless the advisor and the owner of data have properly approved doing so.

Use of Human Subjects

Faculty and students that engage in research involving human subjects must first obtain prior approval from the Institutional Review Board (IRB). "Human Subject" means a living individual about whom an investigator (whether professional or student) conducting research obtains (i) data through intervention or interaction with the individual or (ii) identifiable private information. This means that even if you are just going to be conducting a survey, you **MUST** obtain IRB approval in advance. Approval is required no matter who you will be interacting with — even your friends or family!

Composition of Group Projects

Individual and group roles for the semester-long design challenge.

Group Members

Each student will be assigned to a group for the duration of the course. These groups will be selected by the instructor on the basis of expressed preferences and skills of the students.

Project Advisor

The instructor acts as the group advisor, and will actively monitor progress and provide assistance, expertise, guidance and project evaluations. Project leadership and management and the quality of the final product are the students' responsibilities. The advisor meets with the group each week during the studio-style class period. The advisor may arrange for travel and facilitate interactions with the client and help to guide the scope of the projects. The advisor may offer reactive advice, reacting to activities in the group and giving advice when asked. The advisor may also give proactive advice regarding possible productive avenues for progress or regarding deficiencies and deadlines. It is important that students understand the role of the advisor and the limited, though important, role they play in directing the project.

Stakeholders and Clients

Projects will involve stakeholders (government agencies, industry, non-profits, and private citizens) and clients who have a considerable interest in the project and/or the resulting data. There may be confidentiality, proprietary data, legal, intellectual property, and/or political issues that will need to be carefully addressed by the student groups. Students must respect the privacy of these stakeholders in a professional manner.

Required Work Products

The following describes the required work products and deliverables for the semester-long design challenge.

Literature Review (10 points toward course grade)

One of the most important sections of the proposal is the background literature review. A considerable amount of the effort on the project should focus on obtaining relevant

information, becoming extremely knowledgeable about the current state of knowledge related to a topic, and preparing a review of the literature as it relates to the project. The literature review should focus on peer-reviewed literature (journal articles, chapters from edited books, scholarly books) and government reports (which are often not peer-reviewed but are performed by credible scientists).

It is important that the literature review not be too narrowly focused. For example, if the group is analyzing improvements to transportation infrastructure, it will need to review literature related to that topic. In addition, if the group is going to be using scenarios as a tool for projecting future transportation needs, the literature search and review will also need to explore the use of this tool, even if the tool has never been used in transportation infrastructure studies before.

Management Plan (5 points toward course grade)

The Management Plan outlines a group's management structure and general plan for the form and function of their group. Ideally, the management plan will be completed within the first three weeks of the semester. It should specifically include:

Group structure and management. Includes a definition of the various "jobs" necessary to execute the project (e.g., publications manager, data/computing manager, project director, etc.). An organization chart is useful.

Meeting structure. How often will meetings be held? How will meetings be run? Who calls meetings? Will some meetings include advisors and others not? Will minutes be taken and, if so, by whom?

Responsibilities of group members. Includes duration of positions in the case of rotating roles.

Systems to ensure deadlines are met. This is an important task. If there are delays or failures, the entire project can be adversely affected.

Conflict resolution process. A common problem in groups is the problem of the "slacker". It is better to decide on ways to deal with a slacker before anyone becomes a slacker. The starting point for dealing with a slacker is for the group to assume all or some of the responsibility for the problem. If there is a slacker, it is likely that the group is failing in some way to motivate that individual. The group's plan should first focus on motivating the individual. Methods for dealing with this problem include peer review, division of responsibilities, documentation of slacking behavior, and even the "firing" of a person from the group (though this action would need to be taken in concert with the instructors for the course).

Procedures for documenting, cataloging, and archiving information. Documents, contact information, messages, calendar, website, budget projections, and expenditures must be accessible to all Group Project members.

Guidelines for interacting with advisors, clients, or consultants. What role will the advisors play? Do they want written progress reports? Do they want drafts of sections of the report? How much time do they require for document review? How frequently will

you meet with your client? How will you keep your client informed of your progress? How will you deliver your product to advisors and clients— electronically or in hardcopy?

Overall expectations of group members and advisors. It is strongly recommended that you discuss expectations with your advisors. It will be useful to include in the management plan the expectations of the advisor, the expectations of students with regard to advisor involvement, and the grading criteria.

Project Proposal (15 points toward course grade)

Each group is required to prepare a proposal for the project based on the needs of the client, their skills and aptitudes, and the available data. The elements of the project proposal will be:

- Title Page
- Introduction
- Research Question(s)/Project Approach
- Literature Review (see above)
- Methods
- Deliverables and Timeline
- Management Plan (see below)
- Literature Cited

The project proposal is limited to 20 single-spaced pages. This limit does not include the title page and literature cited. Further details and revisions of the proposal format may be provided by the group advisor.

Proposal Presentation (5 points toward course grade)

At the scheduled time, each group will present their project proposal to the class and the client. The purpose of the review is for groups to gain critical feedback regarding their project's scope, the importance of the project, the proposed workplan, and the potential implementation implications of the results. This review process will improve the real-world nature of the problems and solutions the groups pursue.

The proposal presentation should be approximately 20 minutes long with time for questions afterwards. One or two students should present; it is neither necessary nor advisable for every group member to speak.

Data Report (10 points toward course grade)

Data management and organization is essential for the success of any research project in addition to the reproducibility of a given methodology. Your task for the Data Report is to compare and document at least two different data sources informing your group project design challenge. The Data Report should include the following items for each dataset: 1) a description of the dataset; 2) the spatial scale of analysis; 3) the temporal scale of analysis; 4) the source of the data; 5) at least one map you produced using ArcGIS representing the data; 6) a summary of variables available for analysis; 7) a description of

any major strengths or weaknesses of the dataset; and 8) references for your data sources, including links as applicable.

Final Report Draft (10 points toward course grade)

Students will prepare and submit a Final Report Draft three weeks before the Final Report is due. The group project advisor(s) will provide thoughtful and substantive feedback on the organization and content of the Final Report Draft so that students can make the necessary updates and revisions for the Final Report.

See instructions in the Final Report assignment description below regarding required content, organization, and formatting protocols to include in the Final Report and Final Report Draft.

Final Report (25 points toward course grade)

By the end of the spring semester, students must submit a final report of their group project. The deadline for the final report is firm. The final report provides a complete discussion of the project's goals, objectives, methodologies, and accomplishments.

Students should keep in mind that it is doubtful that they will be able to complete their reports by the end of spring semester if they do not present a high-quality draft to the advisors by the time specified. Some advisors will expect drafts earlier and may require longer periods for review and comment than others. In general, students should expect that their advisors will require at least one week, but as many as two weeks, to complete a thorough review. It is likely that more than one iteration will be necessary before the advisors find the report to be acceptable. Thus, it is critical that students and advisors discuss and agree upon a realistic timeline and have consistent expectations in terms of turn-around time. The final report should not include information restated from the group's Management Plan.

The final report typically includes the following:

- Title
- Abstract (not to exceed 250 words)
- Introduction
- Methods
- Results
- Discussion
- Literature Cited

Final reports must be free of typographical, formatting, and other errors. More details on final report format may be provided.

The final report should reflect that the group has 1) the ability to clearly articulate the problem orally and in writing; 2) the ability to clearly articulate the scope of the work; and 3) the ability to clearly articulate how their work is related to larger related issue(s).

Conclusions and recommendations in the report are to be based only on 1) original interpretation and synthesis of the work of others; 2) original data and interpretations of that data; and/or 3) a combination of 1 and 2. The unsupported expression of opinion in the final report is not appropriate.

When monetary support has been provided, acknowledgement must be made to individuals and/or organizations for their support of the project. Individuals or organizations that have contributed non-monetary support in the form of time, information or useful advice, should also be acknowledged if the group members and advisors agree it is warranted.

Individuals and organizations have the right to refuse being acknowledged. Prior to finalizing acknowledgements, the group must inform any person to be acknowledged of its intent to do so in the report.

Adherence to accepted rules of citation is required. Groups should use the citation format established by the Spatial Sciences Institute for its graduate programs. Only readily retrievable sources are acceptable.

Final Presentation (10 points toward course grade)

Groups will present their final results as part of the Geodesign lecture series at noon on Friday near the end of Spring semester. These presentations should be polished, professional, and accompanied by high-quality and error-free graphics.

Client Presentation

A presentation of the project will be scheduled at the client's convenience. Groups will work with the client to arrange the scope, length, and format of this presentation (oral, written, poster, workshop, etc.).

Self and Peer Evaluation (10 points toward course grade)

Each individual in the group must complete a self-evaluation and peer evaluations and submit them to the instructor by the last day of classes of the semester. Templates for these reviews will be posted to the course website.

Project Evaluation

Student performance in a group project is evaluated and graded based on demonstrated depth of understanding, critical thinking, interdisciplinary approach, originality, resourcefulness, professionalism, and communication skills. Specific criteria that faculty advisors will use in assigning project grades include:

- A working understanding of the published literature and facts immediately relevant to the project. A literature review should be completed as part of the project proposal.

- A critical perspective on the quality and shortcomings of prior work relevant to the project. This should include an identification of attempts to answer similar questions in other contexts.
- A working understanding of the dimensions of the spatial, regulatory, scientific, and design issues of the project and an aggressive plan for integration of these perspectives into the project.
- Originality of analysis, problem formulation, and scope of work. This should be demonstrated throughout the project.
- Formation of working relationships with stakeholders and clients outside of USC. In some cases, outside advisors will be identified when the group project is proposed. In other cases, the students will have to identify stakeholders, sources of information, outside consultants, and/or experts who can provide benefit to the group project.
- Resourcefulness. Throughout the project, students are expected to demonstrate initiative in finding information, identifying tools necessary to achieve their scope, and/or seeking outside advisors as appropriate.
- Punctuality. Students are expected to deliver intermediate and final products on schedule.
- Communication skills. Oral presentations and written reports should be well organized, scholarly, and well communicated.
- Participation. Students are expected to participate and actively contribute in meetings, training sessions, and events.

Grading Breakdown

Assessment	Number	Points Each	Total Points
Literature Review	1	10	10
Management Plan	1	5	5
Project Proposal	1	15	15
Proposal Presentation	1	5	5
Data Report	1	10	10
Final Project Report Draft	1	10	10
Final Project Report	1	25	25
Final Project Presentation	1	10	10
Self and Peer Evaluation	1	10	10
TOTAL	9	-	100

Assignment Submission Policy

Assignments will be submitted for grading via Blackboard by the due dates specified in the Course Schedule below.

Additional Policies

Students are expected to attend and participate in every class session and to complete and upload all assignments before the deadlines detailed in the Course Schedule. Late work will be assessed a penalty of 10% per day and zero grades will be assigned for work that is more than seven days late.

Course Schedule: A Weekly Breakdown

	Topic	Readings and Assignments	Deliverables/Due Dates
Week 1 1/18*	University Holiday *University holiday, no class.		No deliverables.
Week 2 1/25	Introduction to Class Brief introductions coupled with a discussion of class goals, project overview, and course assignments.	Reading: Steinitz Part 1 (pages 3-22) Assigned: Existing Conditions Maps and Descriptive Maps	No deliverables.
Week 3 2/1	Client Visit Meet client and learn background and context for the semester-long design challenge. Group discussion and scope project. Discuss various aspects of organizing, managing, and executing a research project.	Reading: Steinitz Part 2 (pages 25-91); Berenson pages 14-40; McHarg pages 1-29 Assigned: Management Plan and Literature Review	Submit Existing Conditions Maps and Descriptive Maps on Blackboard no later than 2:00 p.m. on Monday, 2/1.
Week 4 2/8	Project Overview Discuss project overview, brainstorm required skills, and project approach(es).	Reading: Berenson pages 41-80; McHarg pages 31-93; Assigned: Project Proposal and Annotated Bibliography	Submit Management Plan on Blackboard no later than 2:00 p.m. on Monday, 2/8.
Week 5 2/15*	University Holiday *University holiday, no class.		No deliverables.
Week 6 2/22	Project Update Provide reports on literature review and projects; citation management; and brainstorm screening criteria.	Reading: Steinitz Part 3 (pages 93-178); Berenson pages 81-104; McHarg pages 95-173	Submit Literature Review on Blackboard no later than 2:00 p.m. on Monday, 2/22.
Week 7 3/1	Project Constraints Discussion project constraints, literature reviews, assign stakeholder advocates, define stakeholder data topics, and stakeholder participation.	Reading: McHarg pages 175-197 Assigned: Stakeholder Data Maps	Submit Project Proposal and Annotated Bibliography on Blackboard no later than 2:00 p.m. on Monday, 3/1.
Week 8 3/8	Geodesign as Collaborative Decision Making Framework Students deliver briefings on their topic of investigation. Students work in groups to advance efforts on their selected research project.	Reading: Steinitz Part 4 (pages 179-201) Assigned: Stakeholder Annotated Bibliography	Submit Stakeholder Data Maps on Blackboard no later than 2:00 p.m. on Monday, 3/8.

Week 9 3/15	Types of Constraints and Opportunity Evaluation Systems A discussion of constraints and opportunities for evaluation systems. Students work in groups to outline a design and plan for their projects.	Assigned: Constraint and Opportunity Model Version 1	Submit Stakeholder Annotated Bibliography on Blackboard no later than 2:00 p.m. on Monday, 3/15.
Week 10 3/22	Client Update Meet with client to discuss progress on design challenge project. Discuss constraint and opportunity models.	Assigned: Data Report; Constraint and Opportunity Model Version 2	Submit Constraint and Opportunity Model Version 1 on Blackboard no later than 2:00 p.m. on Monday, 3/22.
Week 11 3/29	Discuss Design Proposals Design teams display and present their draft proposals to the class. Students work in groups to advance efforts on their research project.	Assigned: Final Project Report Draft	Submit Constraint and Opportunity Model Version 2 on Blackboard no later than 2:00 p.m. on Monday, 3/29.
Week 12 4/5	Data Report Design teams provide update on their group research projects and present data reports to the class.	Assigned: Final Presentation and Final Project Report	Submit Data Report on Blackboard no later than 2:00 p.m. on Monday, 4/5.
Week 13 4/12	Draft Presentation Design teams deliver draft presentation of their research project.		Submit Draft Presentation on Blackboard no later than 2:00 p.m. on Monday, 4/12.
Week 14 4/19	Group Work Session Students work in groups to advance efforts on their selected research project.	Assigned: Self and Peer Evaluations	Submit Final Project Report Draft on Blackboard no later than 2:00 p.m. on Monday, 4/19.
Week 15 4/26	Client Final Presentation Design teams present their group projects, summarizing the topic of investigation, study area, data and methods utilized, findings, and conclusions.		Submit Final Presentation on Blackboard no later than 2:00 p.m. on Monday, 4/26; Self and Peer Evaluations completed in class on 4/26.
FINAL 5/10	Final Project Report Design teams submit their final project report.		Submit Final Project Report on Blackboard no later than 2:00 p.m. on Monday, 5/10.

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
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

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 and 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 – (213) 821-8298
equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of 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
uscса.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

Provides safety and other updates, 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.