

SSCI 585, Geospatial Technology Project Management

Syllabus

Units: 4

Term — Day — Time: Summer 2021, Online

Location: Online

Instructor: Leilei Duan, Ph.D.

Office: AHF B55J

Regular Office Hours: Tuesday 8:00 – 9:00 a.m. PT and
Thursday 1:00 - 2:00 p.m. PT, and by appointment via email.

Contact Info: leileidu@usc.edu, 213-740-6532 (office), see
Contact page on Blackboard for Zoom Room

Library Help: Andy Rutkowski

Office: VKC 36B

Office Hours: By appointment

Contact Info: arutkows@usc.edu, 213-740-6390,
<http://bit.ly/andyhangout>

IT Help: Richard Tsung

Office: AHF B57E

Office Hours: By appointment

Contact Info: ctsung@usc.edu, 213-821-4415

Course Scope and Purpose

This course provides a practitioner's perspective of geospatial technology project management that serves as a required class course for the Spatial Data Management track in the Geographic Information Science & Technology (GIST) M.S., the Human Security and Geospatial Intelligence M.S., and the Geospatial Leadership Graduate Certificate programs, and as an elective course for the Geospatial Intelligence and GIST Graduate Certificate programs. Although many people believe GIS project management is about software design and development, computer hardware, and geospatial data, experienced GIS project managers understand that there is much more to it. This course takes a systematic approach to explore the management issues and methods necessary for developing a successful geospatial technology office and/or project. That said, this course will cover several topics:

Geospatial Project Management Principles – We start by focusing on building support for geospatial technology projects by examining critical topics associated with geospatial project management, including the typical project life cycle, program planning and development, popular organizational structures, financial management, human resources, the technical and operational environment, and communications.

Running a Geospatial Technology Project – Here we examine the fundamentals involved in completing a successful project on time and on budget, by examining a variety of topics associated with funding, financial management, monitoring and reporting, risk management, multi-organizational agreements (collaborations), and the various approaches needed to manage the technical design (system configuration, data, applications) and the development and maintenance of these technical components.

Human Resources – Next, we consider the various roles played by people in geospatial technology projects, covering topics associated with project leadership, team building and capacity building, among others. We will also examine the opportunities for geospatial technology certification and some of the legal and ethical considerations that may influence geospatial technology projects and their outputs (i.e. deliverables).

Current and Emerging Trends – Throughout the semester we consider some of the current and emerging trends that may modify the ways in which geospatial technology projects may be conceptualized and implemented in the coming years. Potential topics include the consequences of choosing open source vs. proprietary software solutions and the contributions of geospatial standards, spatial data infrastructures, web-based geoprocessing service architectures, and volunteered geographic information to current and future geospatial project workflows.

By both necessity and design, this course serves an audience with diverse interests and also ranging from those starting their career to seasoned professionals. To address the interests of this diverse range of students, the instructional materials in this course focus on common principles and tools of geospatial technology project management while also allowing great flexibility in selection of exercises and choice of topic for research reports.

This 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-level 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 also learn much from your fellow classmates. The challenge for us is to replicate such an academic experience within the milieu of "online learning."

All course materials will be organized through Blackboard. The main theoretical concepts will be provided through course notes and assigned readings and the assignments will give students an opportunity to internalize and apply the concepts and theory learned from readings. Some assignments require student interaction, all will benefit from it.

Learning Outcomes

When you have completed this course, you will be able to:

- Identify and critically analyze the issues involved in organizing, planning, monitoring, and controlling a geospatial technology project.
- Initiate a small-scale geospatial technology project by developing project plans and financial budgets, estimating project costs and benefits, developing investment appraisal methods, and using authorization, monitoring, and control processes.
- Identify the role, significance and impact of human resources in a project management setting, and evaluate and implement strategies for managing human resources in geospatial technology projects.
- Review current geospatial technology project management methodologies and appraise their effectiveness and efficacy for managing different types of geospatial projects.

Prerequisite(s): None

Co-Requisite(s): None

Concurrent Enrollment: None

Recommended Preparation: SSCI 581 or permission of the instructor

Course Structure

The main theoretical concepts are provided through a directed reading of the text *The GIS Management Handbook*. Additional readings are assigned throughout to expand on the textbook. These unfold on a weekly basis, generally with a new topic each week with associated readings, and assignments.

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.

Technological and Communication Requirements

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 to show up in your available classes on Blackboard no later than 12 noon, PT on the first day of classes.

Discussion forums – On the Blackboard site, I will post a number of discussion forums and threads related to various course topics. I may or may not participate in these threads but they are vitally important for organizing asynchronous (not at the same time) conversations and opportunities for learning from one another.

Live meetings and presentations – We will use a browser-based service called Zoom to create synchronous interaction sessions. With voice, webcam, and screen sharing capabilities, Zoom can be used to share presentations and even our desktops between two or more people.

Individual meetings – I find it easiest to use either Zoom or the phone for individual meetings.

Technology support – This course has few technology needs but for the need for every student to have: (1) a computer with a fast Internet connection; (2) a functional webcam and a microphone for use whenever a presentation or meeting is scheduled; and (3) a modern web browser.

Communications – This is a distance-learning course, so most of our interactions will be asynchronous. All materials to be handed in will be submitted via links provided on the class Blackboard site. I will also create one Blackboard discussion forum for each assigned discussion. I may create and/or monitor additional discussions in the discussion forum through which we can discuss challenges, ideas, and issues connected with the course assignments, exercises, and projects as the need arises.

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

While I am usually online and will probably respond to emails from students quickly, I will endeavor to respond to all emails within 24-hours of receipt, aiming for no more than a 72-hour 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 of Blackboard. Be sure to check this each time you log onto Blackboard.

Required Readings and Supplementary Materials

The required textbooks for this course are:

- Croswell, P.L. 2019. *The GIS Management Handbook* (Second Edition). Des Plaines, IL: Kessey Dewitt Publications in association with URISA.
- Obermeyer, N.J. and Pinto, J.K. 2008. *Managing Geographic Information Systems* (Second Edition). New York: Gilford Press
- Tomlinson, R. 2013. *Thinking about GIS: Geographic Information System Planning for Managers* (Fifth Edition). Redlands, CA: Esri Press

These books will be supplemented with course notes and a mixture of readings from academic journals, professional reports, and authoritative websites. The following book chapters and journal articles will be posted to Blackboard under Course Documents:

- Goodspeed, R. 2011. From Public Records to Open Government: Access to Massachusetts Municipal Geographic Data. *URISA Journal* 23: 21-32.
- Hodza, P. 2014. Appreciative GIS and Strength-based Community Change. *Transactions in GIS* 18: 270-285.
- Hong, J.E. 2006. Identifying Skill Requirements for GIS Positions: A Content Analysis of Job Advertisements. *Journal of Geography*, 115, 147-158.
- Joffe, B. 2015. A Personal Account of Guidelines for Estimating GIS Return on Investment. *URISA Journal* 27(1): 29-45.
- Miller, H.J. and Goodchild, M.F. 2015. Data-driven Geography. *GeoJournal* 80: 449-461.
- Poore, B.S. and Chrisman, N.R. 2006. Order from Noise: Toward a Social Theory of Geographic Information. *Annals of the Association of American Geographers* 96: 508-523.
- Ramasubramanian, L. 1999. GIS Implementation in Developing Countries: Learning from Organizational Theory and Reflective practice. *Transactions in GIS* 3: 359-369.
- Sieber, R.E. 2006. Public Participation Geographic Information Systems: A Literature Review and Framework. *Annals of the Association of American Geographers* 96: 491-507.
- Sui, D. 2014. Opportunities and Impediments for Open GIS. *Transactions in GIS* 18: 1-24.
- Trapp, N., Schneider, U.A., McCallum, I., Fritz, S., Schill, C., Borzacchiello, M.T., Heumesser, C., and Craglia, M. 2015. A Meta-analysis on the Return on Investment of Geospatial Data and Systems: A Multi-Country Perspective. *Transactions in GIS* 19: 169-187.
- Tulloch, D.L. and Epstein, E. 2002. Benefits of Community MPLIS: Effectiveness and Equity. *Transactions in GIS* 6: 195-212.
- Wang, S. 2013. CyberGIS: Blueprint for Integrated and Scalable Geospatial Software Ecosystems. *International Journal of Geographical Information Science* 27: 2119-2121.
- Wilson, J.P., Butler, K., Gao, S., Hu, Y., Li, W., and Wright, D.J. 2021. A five-star guide for achieving replicability and reproducibility when working with GIS software and algorithms. *Annals of the American Association of Geographers*, 111, in press.

- Wright, D.J. 2012. Theory and Application in a Post-GISystems World. *International Journal of Geographical Information Science* 26: 2197-2209.
- Zerbe, R., Fumia, D., Reynolds, T., Singh, P., Scott, T., and Babinski, G. 2015. An Analysis of Benefits from Use of Geographic Information Systems by King County, Washington. *URISA Journal* 27(1): 13-27.

Description and Assessment of Assignments

Weekly Assignments

There are several different types of assignments due nearly each week in our course that make up a significant part of your final grade. These different types of assignments are described below.

Resume Assignment – 1 worth 2 points. We require all current students to post and maintain a public resume, short biography and recent photo on our shared SSI Student Community Blackboard site. Please prepare your resume in the SSI template which will be provided to you. Unless you opt out, your resume will be included in the Spatial Sciences Institute Graduate Programs Resume Book. This resume book is compiled annually and, along with our web presence, is used to promote our programs, and more importantly, your skills, experience and professional aspirations.

Reading Assignments – 6 worth a total of 18 points. These will focus on the theory portion of the course as presented in the weekly readings. The objective is to help you evaluate and integrate the information you have acquired from the course readings. Some of these will involve discussions and collaborative work, and some will be individual efforts. The first reading assignment is required and from there, you are free to choose any five of the 13 subsequent assignments. However, you must complete and submit them for grading in the weeks specified in the Course Schedule at the end of this syllabus.

Discussion Forums – 4 worth a total of 8 points. These will focus on varying combinations of theory and practice, and anticipate that you post a minimum of four new messages and at least two replies to messages posted by your classmates at designated times throughout the semester.

Exercises – 5 worth a total of 25 points. To demonstrate that you understand the basic concepts and skills learned in the class, you will complete five exercises that will integrate key concepts and ideas, and take some independent thought. The first exercise is required and from there, you are free to choose any four of the five subsequent exercises. However, you must complete and submit them for grading in the weeks specified in the Course Schedule at the end of this syllabus.

Research Report – 1 worth a total of 10 points. The research report will provide you with an opportunity to explore established codes and challenges in the area of geospatial ethics through a suite of case studies.

Final Project

The final project will provide you the opportunity to integrate all that you have learned in the semester for a specific application. According to detailed guidelines that I provide, you will select a case study of geospatial technology project implementation and write a detailed case study that includes primary data gathered from project participants. The three components of the Project are:

Presentation – 1 worth 12 points. This assignment will require some independent thought and synthesis, and allow you to explore a case study of your choice. The results will be presented in Week 10 with the help of a PowerPoint slideshow. You will get my guidance with planning the rest of your research.

Project Report – 1 worth 25 points. A written report detailing your case study, major findings, and sources.

Grading Breakdown

Assessment	Number	Points Each	Total Points
Weekly Assignments			
Resume Assignment	1	2	2
Discussion Forums	4	2	8
Exercises	5	5	25
Research Report	1	10	10
Reading Assignments	6	3	18
Project Components			
Presentation	1	12	12
Project Report	1	25	25
Total			
Total	20	-	100

Assignment Submission Policy

Unless otherwise noted, assignments must be submitted via Blackboard by the due dates specified in the Course Schedule below and on the assignment instructions. You are expected to work on this course each week to stay current with readings and assignments. You must upload all assignments to Blackboard before the posted deadlines.

It is critical to note the following two items:

- Late postings and assignments will be docked one letter grade and no grade will be given for postings or assignments turned in more than one week late.
- Additionally, no written work will be accepted for grading after 5:00 p.m. PT on the last day of classes (i.e., August 15, 2020).

Course Schedule

	Topic	Readings and Assignments	Deliverables/ Due Dates
Week 1 5/19* *Class starts on Wednesday, 5/19	Introduction: Introduction to the course and the ways in which the various topics and tasks will be woven together.	Croswell, Ch. 1 Ramasubramanian (1999)	Resume Assignment Reading Assignment #1
Week 2 5/24	Geospatial Program Development: Role of planning and management in developing a successful geospatial technology business and/or program.	Croswell, Ch. 2 Hong (2016) Tulloch and Epstein (2002)	Exercise #1 Reading Assignment #2 Reading Assignment #3
Week 3 6/1* *Monday, 5/31 is a university holiday	Geospatial Program Development (Cont.): A second take on the same topics – this time through the eyes of Roger Tomlinson who is often afforded the title of "founding father" of GIS.	Tomlinson, Ch. 1-9 Hodza (2014)	Exercise #2 Reading Assignment #4
Week 4 6/7	Geospatial Program Organizational Structure, Governance and Coordination: Role of planning and development, organizational structures, leadership and governance, and communications in successful geospatial programs.	Croswell, Ch. 3 Goodspeed (2011)	Reading Assignment #5
Week 5 6/14	Geospatial Program Organizational Structure, Governance and Coordination: A second take on the same topics – this time through the eyes of two accomplished GIS scholars, Nany Obermeyer and Jeffery Pinto	Croswell, Ch. 3 Goodspeed (2011) Obermeyer and Pinto, Ch. 3-4 Tomlinson, Ch. 11 Joffe (2015)	Exercise #3 Reading Assignment #6
Week 6 6/21	Human Resources: Role of project leadership, team building, capacity building (including opportunities for geospatial certification) and multi-organizational agreements (i.e. collaborations) in contributing to successful geospatial programs.	Croswell (2011) Ch. 4 Zerbe et al. (2015)	Report #1 Reading Assignment #7

	Topic	Readings and Assignments	Deliverables/ Due Dates
Week 7* 6/28	Funding, Financial Management, and Collaboration: The financial aspects, such as funding, financial management, monitoring, and reporting, and risk management that contribute to successful geospatial programs and the completion of projects on time and on budget.	Croswell, Ch. 5 Trapp et al. (2015)	Exercise #4 Reading Assignment #8
Week 8 7/6* *Monday, 7/5 is a university holiday	Funding, Financial Management, and Collaboration (Cont.): A second take on finance – this time through the eyes of Roger Tomlinson.	Tomlinson, Ch. 10 Sieber (2006)	Reading Assignment #9
Week 9 7/12	Geospatial Program Legal Issues: The ways in which legal and ethical issues influence the geospatial sector both in the U.S. and further afield.	Crowell, Ch. 6 Wang (2013)	Exercise #5 Reading Assignment #10
Week 10 7/19	Management of Geospatial Program Technical Elements: Role of technical design (system configuration, data, applications) and the development and maintenance of these technical components in contributing to successful geospatial programs.	Croswell, Ch. 7 Miller and Goodchild (2015)	Presentation Reading Assignment #11
Week 11 7/26	Geospatial Office Operations, Service Delivery, and User Support: Role of the operational environment in helping to shape and sustain successful geospatial programs.	Croswell, Ch. 8 Sui (2014)	Reading Assignment #12
Week 12 8/2	Geospatial Projects and Project Management: The ways to combine all of the aforementioned components for successful geospatial projects.	Croswell, Ch. 9 Poore and Chrisman (2006)	Exercise #6 Reading Assignment #13
Week 13 8/9	Wrap-up and Final Report: Current and emerging trends, including the consequences of choosing proprietary vs. open source software solutions, geospatial standards, spatial data infrastructures, web-based geoprocessing service architectures, and volunteered geographic information, and how they are likely to influence future geospatial projects.	Croswell, Ch. 10 Wright (2012) Wilson et al. (2021)	Reading Assignment #14 Report #2 (Due 8/15 at 5:00 p.m. PT)

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

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

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.