San José State University
College of Social Science, Department of Urban and Regional Planning
47846 + 49677, GEOG175 - GIS Project Development & Lab / 47847, GEOG290 Seminar in Research Design in Geographic Information Science Fall, 2019

Course and Contact Information

Instructor:	Kerry Rohrmeier, PhD
Office Location:	WSQ113-A (Geospatial Lab Office)
Telephone:	(408) 924-5475, but email yields a faster response
Email:	kerry.rohrmeier@sjsu.edu
Office Hours:	Wednesday 1:00-3:00 pm, and by appointment
Class Days/Time:	GEOG175 (Lecture) – Wednesday 6:00-7:45 pm GEOG175 (Lab) – Wednesday 8:00-10:45 pm GEOG290 – Wednesday 6:00-8:45 pm
Classroom:	WSQ113

Course Format

This course meets weekly but makes effective use of the Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking Canvas regularly since all materials such as syllabus, handouts, notes, assignment instructions, etc. can be found there.

Course Description

GEOG175 Creation of geographic information system databases and application software to solve specific problems in such areas as resource and facilities management, demographic analysis and planning. (3 units)

GEOG290 Introduction to research in geographic information science. Includes definition of research problems, design of research project, identification of appropriate methodologies for acquiring, organizing and analyzing data, and presentation of research results. Research paper. (3 units)

Course Learning Outcomes (CLO)

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

- CLO 1 *Demonstrate the ability to define a research problem and design and execute a research program.*

  All course assignments plus the final paper require independent sourcing, reading, and analytical techniques to support each geography graduate student's self-selected research problem and program. The final paper is customized to each student so that his/her work effort is applicable to his/her own undergraduate or graduate study.

- CLO 2 *Demonstrate the ability to communicate research results in written, graphic, and verbal form.*

  Students will present their specific research through written assignments, presentations, and display charts, graphs, and maps each week.

- CLO 3 *Demonstrate understanding of how GIS and technology may be applied to a variety of problems.*

  ArcGIS, ArcPro, ArcGIS Online, open source platforms, or other software for spatial analyses and geostatistics can be used for problem solving as part of this course.

Required Texts/Readings

No textbook is required for this course. Weekly content will be posted in the Canvas 'files' tab or linked to the course schedule.

Supplemental Texts to Use as Reference Throughout Your Graduate Research Experience

Firebaugh, G. 2008. *Seven Rules for Social Research*. Princeton, NJ: Princeton University Press.

Gatrell, J., G. Bierly, and R. Jensen. 2012. *Research Design and Proposal Writing in Spatial Science, 2nd Edition*. Berlin: Springer-Verlag.

Montello, D. and P. Sutton. 2013. *An Introduction to Scientific Research Methods in Geography & Environmental Studies, 2nd Edition.* Thousand Oaks: Sage.

Technology Requirements

ESRI Arc products are required for this course. Students must download a recent software version, and if needed can email me for a free 1-year free educational license code.

Library Liaison

You can seek assistance from Nyle Monday in the MLK library at nyle.monday@sjsu.edu or (408) 808-2041.

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities.

1) A minimum of two instructor check-ins are mandatory over the term. This may be in person during office hours, or by short scheduled video chats. This will ensure students are progressing in their research and are opportunities for guidance and clarification (CLO3).
2) There are 13 assignments ranging from preparing an annotated bibliography, synthesizing a research question, designing appropriate research methods, and working with GIS and graphics software in an effort to support progress in each student's specific research path (CLO1 and CLO2).
3) Extra Credit. There are opportunities to learn about creative research methods from other faculty and industry professionals who will be speaking on campus and locally. These events will be announced on Canvas. Your attendance, by proof in selfie, will earn you 10-points. You may participate in extra credit opportunities up to three times this term (earning a total 30-points).

Final

The final is customizable to each student's desired goal for this course - whether a methods or results chapter or to complete a draft for review (CLO1). Undergraduate students are encouraged to write a Statement of Research showing topic mastery in scholarly literature plus identifying GIS methods that may be useful in addressing a proposed research topic. This individual assignment must be a minimum of 3,000 words (include a word count) exclusive of front and back materials, figures, tables, and/or appendices. All written work should be referenced and formatted to meet submission guidelines of the AAG, that being Chicago 15th edition (times new roman 12-

point font, 1" margins on all sides).

Grading Information

Grades are determined on a points-based scale and include +/- grades. All students have the right, within a reasonable timeframe, to know their academic scores, to review their graded work, and to be provided with explanations for the determination of their course grades. In keeping with this policy, and to help ensure that grading is responsive, all assignments are due as stated on the Course Schedule and Canvas. **Late work is not accepted in this course.** Please save all your work until after you have checked your final course grade. Then if you have questions about your final grade, you can bring in past work, and if necessary, corrections can be made.

	Points Possible
Participation (including at least 2 instructor meetings during the term)	60
13 Assignments	240
Final	100
Extra Credit: Learn from others by attending a campus or community research presentation	30
TOTAL	**400**

SCALE:

A plus = ≥98 %	A = 94-97%	A minus = 90-93%
B plus = 87-89%	B = 84-86%	B minus = 80-83%
C plus = 77-79%	C = 74-76%	C minus = 70-73%
D plus = 67-69%	D = 60-66%	D minus = 51-59%
		F = ≤50%

Classroom Protocol

- All readings and preparatory assignments must be completed prior to our weekly in-class exercises.
- Plagiarism in any form is unacceptable and will merit a 0 for the assignment.
- This course involves working in pairs and groups frequently, so civility and courteousness are always expected. While we may not agree with other perspectives or approaches stated, respect is mandatory.

University Policies

Per University Policy S16-9 *(http://www.sjsu.edu/senate/docs/S16-9.pdf)*, relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/".

GEOG175 / GEOG290, Fall 2019, Course Schedule

This subject to change with fair notice, please check Canvas regularly for course announcements.

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	8/21 Geography Graduate Students Attend in Person All students have an online assignment	GETTING STARTED Geography Graduate Program & Advanced Certificate Orientation hosted by Dr. Katherine Richardson Read: the course syllabus from start to end. This class will be very demanding. Online Assignment 1: • Part A) Introduce yourself to your classmates. Let us all know your background, your research (topic and status), and your experience with GIS. It is perfectly ok if your answer is "beginner" but then explain what you want to learn, why, and something you think could make for an interesting GIS research avenue. • Part B) Establish your actual baseline workload and commitments and set realistic semester timelines for a course product. Determine your desired individual written outcome and submit this in writing on Canvas. As an undergraduate student it should be a statement of research [that could be used in a grad school application] exploring different GIS tools and techniques available to address the geographic research avenue you stated above. As a graduate student you should have a project or thesis idea – ideally one which requires a methods chapter. Part of this should, though not always does, contain a mapping element. If your methods chapter is already complete, then use this term to run your analysis and write a results chapter instead.
2	8/28 In Person	INTRODUCTION – Defining research design Read: de Vaus, David. 2001. *Research Design in Social Research*. SAGE. http://www.nyu.edu/classes/bkg/methods/005847ch1.pdf Note: this reading gets fairly complex. Do not get overly bogged down in the details, but instead try to understand the larger message. Assignment 2: Hone your research interest into a single research question. *Tip:* you will have likely achieved this when you are extremely specific and the project or thesis title almost writes itself.
3	9/4 In Person	APPROACH – Determining the correct method for your question? Here are your choices. Read: USC Libraries Research Guide. 25 Jan 2017. Types of Research Design. http://libguides.usc.edu/writingguide/researchdesigns

Week	Date	Topics, Readings, Assignments, Deadlines
		Assignment 3: Identify any two methods that you believe will best answer your stated research question and discuss the pros and cons in an annotated table format. In doing this identify which method wins out?
4	9/11 In Person	SETTING GOALS – Let's find venues for your work Not all conferences and journals are equal. Let's take a look at rankings and make grand plans. Identify the professional affiliations best suited for your interests, locate their upcoming regional and national conferences, and find out the requirements for peer-reviewed journal submissions. Assignment 4: • Write an abstract for an intended conference • Select the journal you consider to be the best fit for your work and write a cover letter to the editor explaining why your manuscript will be a perfect contribution to this publication.
5	9/18 Online	ETHICS – Urban & Regional Planning, Geography & SJSU This is fundamentally important for social scientists. Does your project involve working with animals or humans? Will you be asking anyone anything about your project? Navigating the university Institutional Review Board (IRB) and working with human subjects. Read: Sigma Xi. 1999. *The Responsible Researcher*. https://www.sigmaxi.org/docs/default-source/Programs-Documents/Ethics-and-Research/responsible-researcher.pdf?sfvrsn=2 Read: AAG Statement on ethics Read: SJSU IRB Policies then Complete CITI Training Assignment 5: Complete the SJSU IRB application based on your project or thesis. If you are an undergrad or have a graduate project for which IRB absolutely does not apply, then you must create a mock scenario and complete this application accordingly.
6	9/25 In Person	SCHOLARSHIP - By now you should be experts at accessing scholarly materials through the campus library. It is important in all research, especially projects and theses, to have what you need, neatly organized, when you need it. This means knowing what's available and requesting these materials early and often. A well-written final project/thesis should have at minimum of 60 reputable sources, if not more. That said, a methods chapter would not be where you discuss most sources as they frequently belong in the Introduction Chapter. Still, a few great works will be helpful in guiding your own methodology, and

Week	Date	Topics, Readings, Assignments, Deadlines
		thus deserve credit. If you need assistance finding sources do yourself the favor of contacting our department Library Liaison, Nyle Monday (see page 2). Assignment 6: • Part A) Prepare a bibliography of no less than 10 scholarly sources pertaining to your project/thesis or statement of research. This needs to be compiled in proper citation format as if it were for submission to the *Annals of the AAG* (Chicago 15th Ed). After each bibliographic entry you need to paste the source abstract or introductory paragraph. • Part B) So that no one is tempted to just borrow results from a quick or cursory academic search premier query. You must submit evidence of scholarly article downloads too by compiling them into an organized folder and screenshot your directory in list format.
7	10/2 In Person	GIS DATA EXPLORATION –I am challenging you to find out what data is readily available today. So rarely does the perfect dataset for your highly specific research question exist, let alone reveal itself magically. Whittle down what you do find with the low probability of projections overlaying perfectly and you may nothing. This can feel so defeating, and you can spend hours/days/weeks/months screaming at your screen in frustration. I actually know someone who spent two years waiting on data to move forward. Lesson here, exploration is one of the most time consuming and draining aspects of geographic research. Assignment 7: • Part A) List all the data layers you find on your topic and create a bibliography identifying the creator, data format (images, rasters, tables, .shp, .gdp, .mxd), meta/description, and link to location. Then download it, package it into an organized folder, and submit a screenshot of the listed files: 20-minimum. • Part B) Submit a list of all data you think you still need (i.e. what is missing to answer your question) along with a short statement for each as to why you need it (meaning what gap does this perfect data fill). 10-minimum.
8	10/9 In Person	ADVANCED GEOSTATISTICS Guest instructor Dr. Priyanka Vyvas from the University of California, San Francisco Public Health fellowship will be coming to tell us about her NIH funded Public Health geospatial research and teach us a bit about the analysis tools she uses.
9	10/16 In Person	GIS TOOLS & TECHNIQUES I – Eventually routine GIS methods plateau, and one often becomes accustomed to running a few key extensions and tools. Your once breadth of knowhow can fall by the wayside quickly. Given that the skill level in this course ranges from almost no GIS history to employed professionals makes a one size fit laboratory exercise very difficult. Here is your opportunity to refresh or advance. You may use these two weeks to progress your research design in GIS with some independence.

Week	Date	Topics, Readings, Assignments, Deadlines
		Assignment 8: You may wish to request a step-by-step ESRI ArcGIS lab if you are a very new GIS user. If you are at least moderately familiar with ArcGIS then you need to identify a suite of tools that you are unfamiliar with but that intrigue you. None knows every tool or operation so dig a little to make this exercise worthwhile. Find a pertinent dataset to play with (or perhaps you have one) and run all commands associated with this toolset until you get results whether statistical, attribute table, or map.
10	10/23 In Person	GIS TOOLS & TECHNIQUES II – Repeat Now do it all over again but use different data and a different toolset. Assignment 9: You may wish to request a step-by-step ESRI ArcGIS lab if you are a very new GIS user. If you are at least moderately familiar with ArcGIS then you need to identify a suite of tools that you are unfamiliar with but that intrigue you. None knows every tool or operation so dig a little to make this exercise worthwhile. Find a pertinent dataset to play with (or perhaps you have one) and run all commands associated with this toolset until you get results whether statistical, attribute table, or map.
11	10/30 In Person	COMMUNICATE - Research is endurance effort and what's the point if nobody understands your ideas, goals, or results? Findings need to be interpretable and communicated quickly, and clearly, to all intended audiences. Watch: Marshall, Melissa. 2012. TED Global: Talk Nerdy to Me https://www.ted.com/talks/melissa_marshall_talk_nerdy_to_me Assignment 10: Researchers are encouraged to present their findings at professional conferences. These 15-minute conference-style talks should cover current research, methods, and findings. If you are not yet at this point, then present a scholarly literature review on your interest. This will force you to get more sources toward writing your final. Remember, literature reviews must cover three pertinent research lines. In your closing statement mention how you believe your work will extend an existing body of knowledge.
12	11/6 In Person	DESIGN – Pictures really are worth 1,000 words! Methods sections can be really challenging, and boring, to write and even more so to read. Why not convey your step-by-step analysis as artwork. Check out: Cynthia Brewer's map tool which has made quicker work out the once arduous color selection conundrum. Works for all color visuals http://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3 Assignment 11: Methods chapters are made for this assignment. Communicate your research design as a flowchart or directional graphic using any software you are comfortable with but submit your work in a .pdf because Canvas is fickle about file types. Make mention which tool(s) you used to create something so spectacular.
13	11/13 In Person	WRITING LAB I Slow and steady wins the race.

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		Read: Gropen, G.G and Judith Swan. Nov-Dec 1990. The science of scientific writing. *American Scientist* http://www.americanscientist.org/issues/pub/the-science-of-scientific-writing Start Assignment 12: This individual writing assignment you committed to must be a minimum of 3,000 words (include a word count) exclusive of front and back materials, figures, tables, and/or appendices. All written work should be referenced and formatted to meet submission guidelines of the AAG, that being Chicago 15th edition (times new roman 12-point font, 1" margins on all sides).
14	11/20 In Person	WRITING LAB II Keep on writing as this had better be good. Finish assignment 12: Submit your draft for peer-review on Canvas by **11/25.** I will put the submissions in a folder where reviewer can access them.
15	11/27 Online	PEER REVIEW – Publishing is no easy task, but it is an important part of the job. Reviewers can be harsh critics and that which does not kill us makes us stronger, and often the writing better. Assignment 13: Below you have been assigned a peer review team for your final written product. Feedback from two assigned reviewers is required for each paper before a final draft can be submitted in this course. Reviewers are encouraged to pick apart the readability of the writing, and also look for holes in the research design and chosen methods. Vague or glossed-over commentary by any reviewer will result in the reviewer receiving a low grade on this assignment because this is a disservice to the editorial process and to the author's original contribution. Each reviewer will review the writing using track changes.
16	12/4 In Person	REVISE - Copyediting makes all writing better. Meet with your editors in person to discuss content. Use remaining class time to make revisions. For your final draft I ask that read each word aloud, then rewrite, ask for advice, then consider asking your editor. Once you have addressed all peer-review comments you are ready for a graduate advisor or committee to review your work.
Final	12/11 5:15-7:30pm	PUBLISH & PRESENT All students will submit their final draft on Canvas before the final. Graduate students must also present their semester work products to the class in a 10-minute slide presentation format.

Peer Review Teams

Author	Reviewer 1	Reviewer 2
Baadal Dhingra, Senior	Taylor King	Reyhane Hosseinzade
Shane Fields, Senior	Lingyu Mou	Taylor King
John Garcia, Senior	Drew Smith	Lingyu Mou
Hector Guardado, Senior	Adam Hall	Drew Smith
Rosaleya Quinto, Senior	Mayra Pelagio	Adam Hall
Kevin Newbury, Senior	Francisco Lopez Tapia	Mayra Pelagio
Adam Hall, MS URBP	Baadal Dhingra	Francisco Lopez Tapia
Mayra Pelagio, MS URBP	Shane Fields	Baadal Dhingra
Francisco Lopez Tapia, MS ENVS	John Garcia	Shane Fields
Evan Bradish, MS Geography	Hector Guardado	John Garcia
Clelia Busadas, MS URBP	Rosaleya Quinto	Hector Guardado
Reyhane Hosseinzade, MS URBP	Kevin Newbury	Rosaleya Quinto
Taylor King, MS Geography	Evan Bradish	Kevin Newbury
Lingyu Mou, MS Geography	Clelia Busadas	Evan Bradish
Drew Smith, MS Geography	Reyhane Hosseinzade	Clelia Busadas