CHRISTOPHER G. PRENER, PH.D.

SYLLABUS

SOC 4650 & SOC 5650: INTRODUCTION TO GIS

SPRING, 2018
SAINT LOUIS UNIVERSITY

Basics

Course Meeting Times

Mondays, 4:15pm to 7:00pm
3600 Morrissey (GeoSRI Lab)

Course Website

https://slu-soc5650.github.io

Chris's Information

Office: 1918 Morrissey Hall
Email: chris.prenerg@slu.edu
GitHub: `@chris-prener`
Slack: `@chris`

Office Hours:

- Mondays, 7:00pm to 7:30pm in 3600 Morrissey (GeoSRI Lab)
- Wednesdays, 10:00am to 12:00pm in 3600 Morrissey (GeoSRI Lab)

Brandon's Information

Email: brandon.siracuse@slu.edu
GitHub: `@bsiracuse`
Slack: `@brandon.siracuse`

Office Hours:

- TBD

Course Introduction

[One] cannot understand social life without understanding the arrangements of particular social actors in particular social times and places. . . ***social facts are located****.*
Andrew Abbot (1997)

Course Description

This class introduces both the theoretical and technical skills that constitute the nascent field of Geographic Information Science (GISc). Techniques introduced include data cleaning and management, map production and cartography, and the manipulation of both tabular and spatial data. The impacts of GISc on public policy, and the effects of public policy on GISc, are also discussed. The course incorporates a wide variety of social, economic, health, urban, meteorological, and environmental data. These data are mapped at a variety of extents, from the City of St. Louis to the St. Louis Metropolitan region, Missouri, all United States counties, and all U.S. states.[1]

[1] This course focuses largely on data for the United States, though we do briefly discuss data standards and projection systems for mapping the entire world as well as other countries.

Course Objectives

This course has six intertwined objectives. After completing the course, students will be able to:

1. *Geographic information science*: Describe the concepts that form the foundation of GISc work.
2. *Data management*: Perform basic data cleaning tasks using `R`, construct geo-databases using ArcCatalog for data organization and storage, and modify that data using ArcMap's geoprocessing tools.
3. *Data visualization*: Create and present visualizations of spatial data using `R` and `ggplot2`, ArcMap, and other design tools.

4. *Analysis development*: Apply techniques that make GISc work more reproducible, accurate, and collaborative using GitHub, 'R', Markdown, and other tools.
5. *GISc and Public Policy*: Describe the ways in which public entities support GISc research and the ways in which GISc research supports public policy goals.
6. *Research synthesis*: Plan and implement a spatial data analysis project that utilizes the techniques described throughout the course.

Core Resources

There are three core documents and resources for this course. This **Syllabus** sets out core expectations and policies for the course. The **Reading List** contains topics, readings (both required and optional), and assignment due dates for each week. These two documents spell out what is *required* for this course. Both of these course documents are available in the `Core-Documents` repository on **GitHub**.[2]

In addition to these documents, regular updates will be provided on the **course website**. Each week will have a corresponding page on the site that includes links to handouts, YouTube videos, sample code, and additional descriptions of concepts covered in class. Please check the website regularly for updates and new content.

[2] GitHub is a website designed for collaboratively working on programming and data analysis projects. It is described briefly below (see page 7) and in more detail in *Sociospatail Data Science*.

Readings

All readings are listed on the **Reading List** and should be completed before the course meeting on the week in which they are assigned. Readings will come from a variety of sources. First and foremost, there are four books required for this course. Each book has been selected to correspond with one or more of the course objectives. The books are:

1. Brewer, C. (2015). *Designing better maps: A guide for gis users*. Redlands, CA: ESRI Press.
2. Gorr, W. & Kurland, K. (2016). *Gis tutorial 1: Basic workbook for arcgis 10.3.x*. Redlands, CA: ESRI Press.
3. Thomas, C. & Humenik-Sappington, N. (2009). *Gis for decision support and public policy making*. Redlands, CA: ESRI Press.
4. Wickham, H. & Grolemund, G. (2016). *R for data science*. Sebastopol, CA: O'Reilly.[3]

[3] The material is also available without purchase in a website format here. Page numbers will be included for both the print and web versions.

I do not require students to buy physical copies of texts. You are free to select a means for accessing these texts that meets your budget and learning style. If e-book editions (e.g. Kindle, iBooks, `pdf`, etc.) of texts are available, they are acceptable for this course. All texts should be obtained in the edition noted above.

Additionally, readings will also be assigned out of two online texts that are both freely available:

5. Healy, K. (2018). *Data visualization for social science* (link).
6. Prener, C. (2018). *Sociospatial data science* (link).

Full text versions of most readings not found in the sources above can be obtained using the library's Electronic Reserves system. The password for the Electric Reserves will be posted on Slack at the beginning of the semester.[4]

[4] Slack is a messaging service designed for group communication. It is described briefly below (see page 7) and in more detail in *Sociospatail Data Science*.

GitHub

The majority of course content (sample code, documentation, and assignments) for this course will be made available using **GitHub**.[5] GitHub is a website used by programmers, data analysts, and researchers to share computer code and projects. GitHub will also be used for assignment submission and feedback. In addition to providing us with platform for hosting course content, using GitHub will give you experience in some of the techniques that researchers use to conduct both open-source and collaborative research.

[5] You will need to sign-up for a free GitHub account and then become a member of the SOC 4650/5650 course organization at the beginning of the semester. A complete introduction to GitHub and how we'll use it is provided in *Sociospatail Data Science*.

Slack

We will be utilizing the communication service **Slack** to stay in touch.[6] Slack allows me to post announcements and updates about the course that you will then receive alerts about. Any changes to our course GitHub repositories will also be posted there automatically. Slack will also provide us with a space to host virtual office hours. This allows students to monitor the types of questions and issues that are arising, and learn from each other's experiences. Slack can be accessed via a web browser or you can optionally install mobile as well as desktop applications, which are available for both Windows and macOS.

[6] A complete introduction to Slack and how we'll use it is provided in *Sociospatail Data Science*.

Software

ArcGIS

The primary software platform we will use is the ArcGIS suite of applications. We will focus on learning two of them - ArcCatalog and ArcMap. Though it is relatively expensive, ArcGIS is the industry standard GIS software application. ArcGIS is available only for Windows. It is available in 3600 Morrissey (GeoSRI Lab) and thus purchasing it is not required for this course. For students who have Windows on their computer, I will make free student licenses available.[7]

[7] Students with newer Apple computers can purchase and install Windows if they want to run ArcGIS. Details are provided on the **course website**.

R and RStudio

The primary tool we will use for data manipulation and analysis is the programming language R. R is open-source, freely available, and highly extensible analysis environment. We'll use RStudio as the "front end" for our analyses. RStudio makes it easier to write R code and to produce well documented analyses. Like the R programming language itself, RStudio is freely available.[8] Both R and RStudio are available in 3600 Morrissey (GeoSRI Lab), and can be easily downloaded and installed on both Windows and macOS computers.[9]

[8] Please be aware that there is a paid version of RStudio - this is designed for corporations and not single users. There is no need to pay for RStudio!

[9] Details on setting up R and RStudio are included on the **course website**.

GitHub Desktop

You will need another free application called GitHub Desktop. This program allows you to easily copy data from GitHub onto your computer. It also makes it easy to upload files like labs and problem sets to GitHub. It is available for both Windows and macOS, and can be easily installed on lab computers in 3600 Morrissey (GeoSRI Lab).[10]

[10] Details on setting up GitHub Desktop are included on the **course website**.

Other Applications

In addition to these specialized research tools, we will need a number of standard applications from the Microsoft Office suite.[11] We will use Microsoft PowerPoint for presenting some map documents, and we will use Microsoft Excel for working with some forms of tabular data and creating "meta dictionaries".

[11] For macOS users, Apple Keynote is an acceptable substitute for PowerPoint and Apple Numbers is an acceptable substitute for Microsoft Excel. Microsoft Office can be purchased for both macOS and Windows through their education program at steeply discounted prices.

Data and Data Storage

Spatial data files tend to be large and not particularly portable. ArcGIS is also particular about where files are stored. If a map is made and the data files are subsequently moved, the links between the map and the data will break and have to be repaired. There is also a large amount of data for this course, and re-downloading it for each assignment or lecture is unfeasible. You will therefore need an external storage device (a USB thumb drive or an external hard drive) for this course. You will need to purchase one if you do not already own one that meets the key specifications: (1) the device meets the USB 3.0 standard and (2) it has at least 20 GB of free space.[12]

I will make most of the required data available on Dropbox[13] in a single `.zip` file.[14] These data should be downloaded and extracted as soon as possible after the start of the semester. I will also release some example data as an `R` package that you will need to download and install. Packages are small programs containing data and code that extend `R`'s functionality. Seeding some data this way will make loading data for in-class examples easier and quicker.

[12] See the **course website** for additional details.

[13] Dropbox is a cloud storage service. You do not need a Dropbox account to download these data. However, I *highly* recommend obtaining a free account and using Dropbox to store files instead of keeping them stored locally on your computer. This should be one element of your strategy for protecting your work, something which is discussed further in *Sociospatail Data Science*.

[14] `.zip` files are compressed file directories. Details on working with these files are included on the **course website**.

Other Materials

All of the course materials are online and can be accessed through the **course website** and **GitHub**, some of the handouts are easiest to use when printed. Each week you'll receive various handouts, including (typically) cheat sheets for `R` functions and ArcGIS processes, an illustration of the workflow we are focused on, the lab, and the problem set. They are designed, like this syllabus, with a wide right-hand margin to facilitate note taking, and they will be distributed with holes already punched in them. Students should purchase a 1.5" three-ring binder along with dividers (either 16 if you want to keep things organized by weeks or 8 if you want to organize based on handout type).

Course Expectations and Policies

General Expectations for Students

My priority is that class periods are productive learning experiences for all students. In order to foster this type of productive environment, I ask students to follow a few policies:

1. Arrive to class on time and stay for the entire class period.[15]
2. Silence *all* electronic devices before entering the classroom.
3. Do not engage in side conversations. This is disrespectful to the speaker (whether me or a classmate), and can affect the ability of others in the class to learn.
4. Be respectful of your fellow classmates. Do not interrupt when someone is speaking, monopolize the conversation, or belittle the ideas or opinions of others.
5. Complete the assigned readings for each class in advance, and come prepared with discussion points and questions.

[15] If you drive to campus, please get an on-campus parking pass for the semester or use a smartphone app to top off your meter. Leaving class to feed your meter is disruptive for both you and your classmates.

Attendance and Participation

Attendance and participation are important components of this course since we only meet once a week. Students are expected to attend all class sessions; missing even one class can create a significant roadblock for many students. Making up missed classes are your responsibility. Please let me know if you will be missing class so that we can touch base about any assignments, and make sure to obtain notes from a classmate. I do make slides available both as embedded decks in the lecture pages on the **course website** and in the lecture repositories on **GitHub**. However, my slides are intended only to serve as references. Please note that lectures and discussions cannot be recorded by any means (e.g. audio or video recordings, or photographs) without my permission.

Communication

Slack[16] and email are my preferred methods of communication. I am on Slack during workday hours, though I may be "away" during meetings and while I teach my other class. I also may have limited availability on Tuesdays, a day that I am not typically on-campus. I will also monitor Slack during weekday evening hours and will respond to messages if I am able. Likewise, I dedicate time to email responses each workday, meaning that my response time is typically within 24 hours during the workweek. Please use your SLU email account when emailing me.

For both email and Slack, if you have not received a response from me after 48 hours (or by end of business on Monday if you messaged me over the weekend), please follow-up to ensure that your message did not get lost in the shuffle.

All messages regarding course updates, assignments, and changes to the class schedule, including cancellations, will be posted on the `#_news` channel in Slack. Changes to the class schedule, including cancellations, will also sent to your SLU email account. It is imperative that you check both Slack and your SLU email account regularly.

Please also ensure that all concerns or questions about your standing in the course are directed to me immediately. Inquires from parents, SLU staff members, and others will not be honored.

[16] More details about Slack and instructions for how to use it are available in in *Sociospatail Data Science*.

Electronic Devices

During class periods, students are asked to refrain from using electronic devices (including cell phones) for activities not directly related to the course. For this class, I expect students to limit their use of electronic devices to accessing course software, readings, and notes.

There is evidence that using electronic devices during lectures results in decreased retention of course content [17] and lower overall course performance.[18] Students who are not using a laptop but are in direct view of another student's laptop also have decreased performance in courses.[19] Conversely, students who take notes the "old fashioned way" have better performance on tests compared to students who take notes on laptops.[20]

I therefore ask students to be conscious of how they are using their devices, the ways such use impacts their own learning, and the effect that it may have on others around them. I reserve the right to alter this policy if electronic device use becomes problematic during the semester.

[17] Hembrooke, Helene and Geri Gay. 2003. "The Laptop and the Lecture: The Effects of Multitasking in Learning Environments". *Journal of Computing in Higher Education* 5(1): 46-64.

[18] Fried, Carrie. 2008. "In-class laptop use and its effects on student learning". *Computers & Education* 50(3): 906-914.

[19] Sana, Faria et al. 2013. "Laptop Multitasking Hinders Classroom Learning for Both Users and Nearby Peers". *Computers & Education* 62: 24-31.

[20] Mueller, Pam and Daniel Oppenheimer. 2014. "The Pen Is Mightier Than the Keyboard Advantages of Longhand Over Laptop Note Taking". *Psychological Science* 25(6): 1159-1168.

Student Support

If you meet the eligibility requirements for **academic accommodations** through the Disability Services office (located within the Student Success Center), you should arrange to discuss your needs with me after the first class. All discussions of this nature are treated confidentially, and I will make every effort to work with you to come up with a plan for successfully completing the course requirements. Please note that I will not provide accommodations to students who are not working with Disability Services.[21]

If you are a **student-athlete** who is in-season, you should discuss your game schedule with me after the first class and share your travel letter with me as soon as you have a copy. You are reminded that games and tournaments are not excuses for failing to complete assignments, and that NCAA rules prohibit student-athletes from missing classes for practice. Low grades that jeopardize eligibility must be addressed immediately by you, not by a coach or academic coordinator.[22]

I also encourage you to take advantage of the **University Writing Services (UWS) program**. Getting feedback benefits writers at all skill levels and the quality of your writing will be reflected in assignment grades. The UWS has trained writing consultants who can help you improve the quality of your written work. UWS's consultants are available to address everything from brainstorming and developing ideas to crafting strong sentences and documenting sources.[23]

[21] Additional details can be found on the Disability Services website. You can contact them at disability_services@slu.edu or 314-977-3484 to schedule an appointment.

[22] More information about resources and academic support for student-athletes can be found at the Student-Athlete Academic Support Services website.

[23] More information on the UWS program can be found on their website. The UWS program has a number of on-campus locations.

Academic Honesty

All students should familiarize themselves with Saint Louis University's policies concerning cheating, plagiarism, and other academically dishonest practices:[24]

> *Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care, and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern.*

Any work that is taken from another student, copied from printed material, or copied the internet without proper citation is expressly

[24] This course is also governed by the College of Arts and Sciences' academic honesty policies, which are available on their website.

prohibited. Note that this includes all maps designed and computer code written for class assignments - each student is expected to author and de-bug their own code, and is similarly expected to produce their own map outputs.[25] All relevant assignments should include in-text citations and references formatted using the American Sociological Association (ASA) or the American Psychological Association (APA) style guidelines. Any student who is found to have been academically dishonest in their work risks failing both the assignment and this course.

[25] See *Sociospatail Data Science* for details on collaboration with your colleagues.

Title IX

All students should familiarize themselves with Saint Louis University's polices on bias, discrimination, and harassment:

> *Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX Coordinator, Anna R. Kratky (DuBourg Hall, Room 36; akratky@slu.edu); 314-977-3886) and share the basic facts of your experience with her. The Title IX coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.*
>
> *If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK.*

Consistent with the above policy, I will forward all reports of inappropriate conduct to the Title IX Coordinator's office. Please also be aware that communications over various online systems, including (but not limited to) Slack, GitHub, and Google Apps, are also covered by this policy.

Course Assignments and Grading

Assignments

Attendance and Participation (10%)

Both attendance and participation are critically important aspects of this class. The class participation grade will be based on (a) attendance, (b) level of engagement during lectures and labs, (c) level of engagement on Slack, and (d) class "entry" and "exit tickets". Detailed instructions for Slack participation as well as details on how the participation grade is calculated will be provided in the `Core-Documents` repository on **GitHub**.

> **SOC 4650** ***only***
> Your participation grade will be split, with 50 points (5% of your final grade) for the first half of the semester (through Lecture-07) and another 50 points (5%) for the second half.

> **SOC 5650** ***only***
> Your participation grade will also include an assessment of the short class discussion you lead on (typically) two case studies from *GIS for Decision Support and Public Policy Making* (2009). These discussions are tied to the fifth course objective and will focus on the policy implications of the projects, the data that they use, and their design. Detailed instructions as well as a grading rubric will be provided in the `Core-Documents` repository on GitHub. The class discussion will be worth 20 points (2% of your final grade), with each half of the semester worth an additional 40 points (4% each half).

Lecture Preps (6%)

Before each course meeting, you will need to complete all assigned readings. For a part of these readings, you will also need to complete a textbook exercise.[26] These prep exercises are designed to get you

[26] Think of lecture preps as getting course credit for doing the assigned readings (which you are expected to do anyway!).

ready for the week's material by exposing you to basic, guided examples before class begins. Instructions for the lecture preps will be posted in the lecture repositories on **GitHub** and will be linked to from the lecture pages on the **course website**. The instructions will also detail the deliverables to be submitted to demonstrate completion of each assignment.

For many of the lecture preps, I will post a YouTube video of me completing the exercise and narrating the process. These videos will be embedded in the lecture pages on the **course website**. You should follow along with the video and use it as a guide for completing the exercise yourself. I will also post replication files that detail the process and, if relevant, the code for completing the lecture prep. Like the instructions, these will be posted in the lecture repositories on **GitHub**.

There will be a total of fifteen lecture preps over the course of the semester, each of which is worth 4 points (0.4% of your final grade). Lecture preps are graded using the "check" grading system.[27] Since replication files are posted, feedback for lecture preps is not generally returned and we will only respond with the number of points awarded if you do not earn full credit.

[27] See *Grading* on page 20 for details on how this grading scale is applied.

Lab Exercises (15%)

Each course meeting (except the first) will include time dedicated to practicing the techniques and applying the theories described during the day's lecture. These exercises will give you an opportunity to practice skills that correspond with the first four course objectives.[28] Instructions for the labs will be posted in the lecture repositories on **GitHub** and will be linked to from the lecture pages on the **course website**. The instructions will also detail the deliverables to be submitted to demonstrate completion of each assignment. Replication files are also provided in the lecture repositories on **GitHub**.

[28] Think of labs as a low-stakes opportunity to practice specific skills. Their scope will be more limited in comparison to the corresponding problem set. My expectations for the design of labs' map layouts will be similarly diminished.

Lab exercises will be completed in small workgroups, though each student is expected to turn in the required deliverables. We will assign students to workgroups and may shuffle their composition over the course of the semester. Completing a lab entails not just successfully submitting the required deliverables but also actively contributing to the group discussions that help to produce them.

There will be a total of fifteen lab exercises over the course of the semester, each of which is worth 10 points (1.5% of your final grade). Lab exercises are graded using the "check" grading system.[29] Since replication files are posted, feedback for labs is not generally returned and we will only respond with the number of points awarded if you do not earn full credit.

[29] See *Grading* on page 20 for details on how this grading scale is applied.

Problem Sets (28%)

Problem sets will require students to draw on a variety of skills, including cleaning data, performing statistical analyses, producing plots, and reporting results. They are designed to assess your progress with the first four course objectives.[30] Instructions for the problem sets will be posted in the lecture repositories on **GitHub** and will be linked to from the lecture pages on the **course website**. The instructions will also detail the deliverables to be submitted to demonstrate completion of each assignment. Replication files that illustrate my approach to each problem set will be posted on **GitHub** in the `Replications` repository once all students have submitted their problem sets.

There will be a total of eight problem sets over the course of the semester, each of which is worth 35 points (3.5% of your final grade). Each Problem Set will include a simple rubric describing how each problem set is evaluated. A key aspect of these assignments is not only demonstrating comfort with a particular set of GISc skills, but also demonstrating and evolving in your analysis development, programming, and cartography skills as well. The weight given to quality of your process, code, and graphic design will increase as the semester progresses.

[30] Unlike lab exercises, you should expect problem sets to be more complex and to draw upon previous weeks' skills in a broader way.

Final Project (40.5%)

The final project corresponds with the sixth learning outcome. You will identify a social phenomena of interest from a dataset of City of St. Louis Citizens' Service Bureau (CSB)[31] requests for service. This project will require you to draw on a variety of GISc techniques including analysis development, data cleaning, database construction, GIS visualization, and data presentation. Some parts of the project will be conducted in small groups, but all students will submit their own final set of deliverables. This process and project mirrors the steps taken to author a geospatial conference poster presentation (for all students) and a geospatial journal article (for students enrolled in SOC 5650).

Detailed instructions and rubrics will be made available on **GitHub** in the `Final-Project` repository. In brief, all students will select a topic. Students will submit their topic by Lecture-03 (**February 5th**) as an "Issue" in their individual **GitHub** assignments repository. Groups will be formed based on topic area, and data cleaning and demographic map production work will be divided among group members. As work progresses, there will be a number of **waypoints** where students will need to submit updates on their progress. Way-

[31] The CSB is equivalent to many cities' 3-1-1 services, which are non-emergency ways for residents to communicate issues to the appropriate authorities.

points beyond the memo submission are as follows:

- Lecture-05 (**February 19th**) - Meeting report posted in each group's Slack channel
- Lecture-07 (**March 5th**) - Progress report from each student due in group's Slack channel
- Lecture-11 (**April 2nd**) - Draft materials due in each student's assignment repository
- Lecture-13 (**April 16nd**) - Response to reviewer due as a GitHub issue in each student's assignment repository
- Lecture-15 (**April 30nd**) - Progress report from each student due a GitHub issue in each student's assignment repository

Deliverables for each waypoint are described in the final project instructions. All waypoints are graded using the "check" grading system.[32] Final materials will be due at Lecture-17 (**May 14th**, when we will hold a "research conference" in the Busch Student Center. During our conference, you will display your poster and briefly present your project to your classmates.[33] Final deliverables differ by course section:

[32] See *Grading* on page 20 for details on how this grading scale is applied.

[33] Since this is during our finals week session, we will meet from 4:00pm to 5:50pm that evening. The research conference will take place in BSC 173.

SOC 4650 *only*
The final poster will be graded according to the rubric included in the instructions available on **GitHub** in the `Final-Project` repository. The final project deliverables' grades will be broken down the following way:

SOC 4650 Final Project

Assignment	Weight	Points	Qty.	Total
Memo	2.0%	20 pts	x1	20 pts
Progress Reports	8.0%	20 pts	x4	80 pts
Draft Poster	7.5%	75 pts	x1	75 pts
Final Poster	20.0%	175 pts	x1	175 pts
Final Code & Docs	6.0%	60 pts	x1	60 pts
Total	41.0%			410 pts

SOC 5650 *only*
The final poster will be graded according to the rubric included in the instructions available on **GitHub** in the `Final-Project` repository.

In addition to the poster, students are expected to complete a final research article of approximately 5000 words. This should

be formatted as an empirical journal article, and detailed instructions and a rubric will be provided on **GitHub** in the `Final-Project` repository. An annotated bibliography with twenty to twenty-five scholarly, peer-reviewed sources is due in class at Lecture-07 (**March 5th**). Like the other waypoints, the annotated bibliography will be graded using the "check" grading system.[34] The final paper will be due at the presentation session on **May 14th**.

[34] See *Grading* on page 20 for details on how this grading scale is applied.

The final project deliverables' grades will be broken down the following way:

SOC 5650 Final Project

Assignment	Weight	Points	Qty.	Total
Memo	1.0%	10 pts	x1	10 pts
Progress Reports	6.0%	10 pts	x4	40 pts
Annotated Bib.	3.5%	35 pts	x1	35 pts
Draft Poster	3.0%	30 pts	x1	30 pts
Draft Paper	3.5%	35 pts	x1	35 pts
Final Poster	10.0%	100 pts	x1	100 pts
Final Paper	10.0%	100 pts	x1	100 pts
Final Code & Docs	6.0%	60 pts	x1	60 pts
Total	41.0%			410 pts

Submission and Late Work

Copies of all assignment requested deliverables should be uploaded to your private assignments repository on GitHub[35] before class on the day that the assignments are due. All assignments will contain details on required deliverables.

[35] See *Sociospatail Data Science* for additional details about submitting assignments.

The GitHub submission policy is in place because it facilitates clear, easy grading that can be turned around to you quickly. Submitting assignments in ways that deviate from this policy will result in a late grade (see below) being applied in the first instance and a zero grade for each subsequent instance.

Once the class begins, any assignments submitted will be treated as late. Assignments handed in within 24-hours of the beginning of class will have 15% deducted from the grade. I will deduct 15% per day for the next two 24-hour periods that assignments are late. After 72 hours, I will not accept late work.[36] If you cannot attend class because of personal illness, a family issue, jury duty, an athletic match, or a religious observance, you must contact me beforehand to discuss alternate submission of work.

[36] For this class, this means that all work must be handed in by 4:15pm on the Thursday after the assignment was due.

Extra Credit

From time to time I may offer extra credit to be applied to your final grade. I will only offer extra credit if it is open to the entire class (typically for something like attending a lecture or event on-campus). If I offer extra credit, I will typically require you to submit a short written summary of the activity within a week of the event to obtain the credit. When offered, extra credit opportunities cannot be made-up or substituted if you are unable to attend the event.

Grading

Grades will be included with assignment feedback, which will be disseminated through Github's **Issues** tool. At midterms and finals, I will upload a summary of all assignment grades to a new **Issues** on GitHub.[37]

[37] If you would like a summary of your grades at any other point, please let me know and I will furnish you with a copy of all current grades.

All grades that use a "check" system (the lecture preps, labs, and some aspects of the final project) will be calculated using the following approach. A "check-plus" represents excellent work and will get full credit. A "check" represents satisfactory work and will get 85% of the points available for that assignment. A "check-minus" represents work that needs substantial improvement and will get 75% of the points available for that assignment.

I use a point system for calculating grades. The following table gives the weighting and final point totals for all assignments for this course:

Grading Point System

Assignment	Weight	Points	Qty.	Total
Participation	10.0%	100 pts	x1	100 pts
Lecture Preps	6.0%	4 pts	x15	60 pts
Labs	15.0%	10 pts	x15	150 pts
Problem Sets	28.0%	35 pts	x8	280 pts
Final Project	41.0%	410 pts	x1	410 pts
Total	100%			1,000 pts

All feedback will include grades that represent number of points earned. If you want to know your percentage on a particular assignment, divide the number of points earned by the number of points possible and then multiply it by 100.

Final grades will be calculated by taking the sum of all points earned and dividing it by the total number of points possible (x,xxx). This will be multiplied by 100 and then converted to a letter grade

using the following table:

Final Grading Scale

Grade Point	Letter	Percentage
4.0	A	93.0-100
3.7	A-	90.0-92.9
3.3	B+	87.0-89.9
3.0	B	83.0-86.9
2.7	B-	80.0-82.9
2.3	C+	77.0-79.9
2.0	C	73.0-76.9
1.7	C-	70.0-72.9
1.0	D	63.0-69.9
0.0	F	< 63.0

No chances will be given for revisions of poor grades. Incomplete grades will be given upon request only if you have a "C" average and have completed at least two-thirds of the assignments. You should note that incomplete grades must be rectified by the specified deadline or they convert to an "F".

Course Schedule

Course Overview

Lecture	Dates	Topics
1	January 22nd	Course Introduction
2	January 29th	Working with Data (Part 1)
3	February 5th	The Nature of Spatial Data (Part 1)
4	February 12th	The Nature of Spatial Data (Part 2)
5	February 19th	Cartographic Design
6	February 26th	GIS Outputs
7	March 5th	Geodatabases
8	March 12th	Demographic Data
9	March 19th	Spatial Joins
10	March 26th	Working with Projections
11	April 2nd	Working with Data (Part 2)
12	April 9th	Geoprocessing (Part 1)
13	April 16th	Geoprocessing (Part 2)
14	April 23rd	Digitizing Data
15	April 30th	Geocoding Data
16	May 7th	Spatial Analyses & Course Wrap-up
17	May 14th	Finals Week - Research Conference

Planned Online Lectures

This semester, we have one class that falls on official university holidays: Spring Break (Lecture-08, **March 12th**). This week will have materials assigned for it, which will include lectures posted on YouTube. These lectures will be shorter than typical in-class lectures. Students should view these lectures during that week and complete the associated readings and lab exercises. Videos will be embedded in the lecture pages on the **course website**.

Easter Break

This year, Easter break for the University is from March 29th through April 2nd. Monday evening classes continue as scheduled at the end of Easter break, so we will meet as normal. Please schedule any travel accordingly.

Class Progression

Each week will be broken down roughly the same way. Class will begin with any relevant "front matter" including follow-up from the previous weeks and relevant announcements. We will then segue into a discussion of GIS and public policy (typically led by a graduate student; this is the fifth learning outcome) before spending the majority of class focused on the day's main topic, which will typically be related to one or more of the first four learning outcomes. Around 6:00pm, we will take a short break. Most classes will end with time dedicated to working through the lab exercise.

Scheduling Notes

The lecture schedule may change as it depends on the progress of the class. However, you must keep up with the reading assignments. In the event of a cancellation due to weather or another disruption, I may alter the lecture schedule.

Since this course only meets once per week, cancellations are particularly disruptive. I will make every effort to schedule make-up classes at a time that works for at least a portion of the class. These class sessions will be recorded and made immediately available using YouTube for students who are unable to attend the make-up class. All students will be responsible for either attending the make-up class or watching the lecture as well as completing all readings, lab assignments, and problem sets for make-up classes.