### Sandoval State University

**Urban and Regional Planning Department**

**Summer 2019**

**ENVS/URBP-179A: Fundamentals of GIS for Urban Planning**

**URBP-278: Introduction to GIS for Urban Planning**

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Rick Kos, AICP and Ben Schuster, MUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office location</td>
<td>WSQ-218C</td>
</tr>
<tr>
<td>Telephone</td>
<td>(408) 924-5854 (office phone, but it’s rarely checked – please use email)</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:Richard.Kos@sjsu.edu">Richard.Kos@sjsu.edu</a>  <a href="mailto:benjaminschuster342@gmail.com">benjaminschuster342@gmail.com</a></td>
</tr>
<tr>
<td>Office hours (Rick)</td>
<td>Tuesdays and Thursdays (June 4 – July 2) 11:00 a.m. – 12:30 p.m.  --- Sign up for office hours here: <a href="https://goo.gl/VxCB81">https://goo.gl/VxCB81</a> ---</td>
</tr>
<tr>
<td>Office hours (Ben)</td>
<td>Wednesdays (June 4 – July 2) 5:15 – 7:00 p.m.</td>
</tr>
<tr>
<td>Class days/time</td>
<td>Tuesdays and Thursdays (June 2 – July 2) 5:30 p.m. – 9:15 p.m.</td>
</tr>
<tr>
<td>Classroom</td>
<td>WSQ-208</td>
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<tr>
<td>Class website</td>
<td>Course material available on Canvas.</td>
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</tbody>
</table>
| Prerequisites | Prerequisites specific to ENVS/URBP-179A: Upper division standing or instructor consent (per course catalog).  
Prerequisites for URBP-278: none.  
No prior knowledge of GIS is required to take this course; however, there is a lot of material to cover and this will be a fast-moving and fairly technologically advanced course. A strong motivation to learn, explore and have fun with computer applications is essential. This course will require a significant amount of independent work and relies heavily on student initiative. |
| Units | 4 units |

### Course Catalog Description

**ENVS/URBP-179A**: Exploration of Geographic Information Systems (GIS) area analysis techniques for spatial information management in local government: planning support systems, needs analysis, envisioning neighborhoods utilizing multiple maps, charts, photos and the internet.

**URBP-278**: Examination of geographic information systems (GIS) applications to urban and regional planning topics. Course may be repeated for credit when topic changes.

### Course Description

Geographic Information Systems, GIS, is a rapidly evolving technology involving the study of the spatial (geographic) location of features on the Earth’s surface and the relationships between them. Because the work of urban planners fundamentally involves the study of location and spatial relationships, today’s employers increasingly expect graduates of urban planning programs to possess a working knowledge of...
GIS. Environmental Systems Research Institute’s (Esri) suite of GIS software – ArcGIS 10 in particular – has become the industry standard and is used by a majority of government agencies and private firms engaged in GIS activities. Specifically, employers are seeking professionals armed with a grasp of geospatial data types (vector, aerial imagery, satellite imagery, geodatabases, etc.), spatial analysis techniques and GIS project management skills in order to effectively study a host of multi-faceted urban planning topics.

Our primary goal is to ensure that by completing the course you will possess the fundamental GIS skills valued by today’s employers. Quite a number of “alumni” from this course have secured internships and full-time jobs at private firms and agencies including the San Francisco Municipal Transportation Agency, the Valley Transportation Authority and numerous municipal planning departments specifically because they demonstrated GIS expertise in their portfolios and during job interviews.

San José State University’s Urban and Regional Planning Department offers three courses specifically devoted to GIS: the course you are taking now, an elective Advanced GIS course, and a one-credit core course, GIS Overview: Urban Planning Applications. All three courses aim to build sought-after GIS skills through a comprehensive, real world-focused course of study in GIS. The introductory and advanced GIS classes are taught mainly as a combined lecture and computer laboratory course using Esri’s ArcGIS 10.6.1 software and a variety of hands-on exercises.

The majority of students interested in taking either elective course typically do not intend to pursue careers dedicated exclusively to the use of GIS; rather, they wish to learn just enough about the technology so it can be one of many tools available to them during their urban planning careers. As such, the GIS courses offered by the Urban and Regional Planning Department are as practical in nature as possible, favoring case studies and the hands-on use of ArcGIS software and with a particular focus on the acquisition and analysis of real-world geospatial data typically used by urban planners.

The course strives to provide a balance between the "how-to" of using ArcGIS 10.6.1 and the "why" of GIS by explaining the roles GIS technology plays in analyzing local and regional (even global) problems. During the first part of the course, you will learn the specific steps necessary to navigate ArcMap and ArcCatalog, acquire and manage geographic data sets, develop effective cartographic techniques, and query the data to answer typical planning-related questions. For some exercises, you will use real GIS data from Bay Area cities, “warts and all”, in order to learn how to overcome typical problems encountered by GIS practitioners. The last part of the course will focus on the development, execution and presentation of a final GIS project.

Since the visual communication of quantitative data is a vital skill for urban planners, this final project will help you further develop your GIS skills by framing an urban planning issue, developing a set of high-quality GIS maps to illustrate the issue, and presenting your maps to the class. A key objective of the final project is to provide you with a portfolio piece to present to current and future employers as evidence of your GIS abilities. We are continually impressed by the work that beginning GIS learners produce for their final projects!

We are looking forward to helping you learn ArcGIS 10.6.1 this semester. As we work together over the next six weeks, you will be encouraged to think about integrating GIS into your other San José State coursework. There are many avenues for assistance and to accelerate your understanding of GIS: in-class exercises and personal guidance from the instructors, at least four office hours per week, assistance from our fantastic teaching assistant, and the ability to reach us via e-mail (we will endeavor to reply to clearly-worded messages very quickly).

There is a lot of work to complete in this course, but we are here to help you succeed – and we’ll have some fun, too. Again, our primary goal is to ensure that by completing the course you will possess the fundamental GIS skills valued by today’s employers. Let’s go!
Course Learning Objectives

Upon successful completion of the course, you will be able to:

1. Describe how urban planners typically use GIS as a tool for analysis and the display of quantitative data to solve urban planning problems
2. Utilize the core components and functionality of ArcGIS 10.6.1
3. Describe a variety of geospatial data types, data sources and metadata management techniques
4. Create, manipulate and query geospatial data
5. Symbolize and classify geospatial data, understanding available choices and the implications of each technique
6. Constructively critique cartographic styles and implement effective cartographic and display techniques

Planning Accreditation Board (PAB) Knowledge Components

This course partially covers the following PAB KSVs:

2b) Written, Oral and Graphic Communication: ability to prepare clear, accurate and compelling text, graphics and maps for use in documents and presentations.

2c) Quantitative and Qualitative Methods: data collection, analysis and modeling tools for forecasting, policy analysis, and design of projects and plans.

A complete list of the PAB Knowledge Components can be found at http://www.sjsu.edu/urbanplanning/courses/pabknowledge.html.

Required Course Text

In keeping with the joint focus of this course on (1) developing ArcGIS skills and (2) the development of effective cartographic techniques, *The GIS 20 Essential Skills, Third Edition* is required and will serve as a reference; it provides detailed, step-by-step instructions in the use of ArcGIS software.


The required textbook may be purchased online (at sites such as Amazon.com) or directly from the publisher. Note that if you purchase a used textbook online, you are responsible for obtaining the book from the seller in a timely manner.

Required Readings

Links to these readings are provided on Canvas.


**Recommended Readings**

*Designing Better Maps: A Guide for GIS Users*, is optional but strongly recommended since it provides a great number of useful and effective design techniques and considerations that you can use to produce professional-quality maps.


Another recommended reading is:


**Required Software**

ArcGIS 10.6.1 and Extensions will be used in this course. Each student will receive a free Education Edition of Esri’s ArcGIS 10.6.1 software for download and use on a personal computer; note that the software will cease to operate one year after installation. Please note that ArcGIS software only runs on the Windows operating system. In order to run ArcGIS in Windows on an Intel-based Mac, virtualization software is needed such as Apple's BootCamp, SWSoft’s Parallels, or VMware Fusion.

Students are not required to install ArcGIS on their personal computer since the laboratory in WSQ208 and “mini-lab” (in the Planning Department lounge, WSQ-218) are available to all students to complete class assignments and homework. If you choose to install the software on your own computer, you are responsible for installing and maintaining it by properly following Esri’s installation instructions, which we will provide. It is HIGHLY recommended that your personal computer have at least 4 GB of RAM installed, since ArcGIS is a very memory-intensive application. Ideally, more than 4 GB of RAM is best if your computer supports it.

If you do plan to use your personal computer to complete assignments started in class, a USB flash drive with at least 2 GB of capacity is strongly recommended for saving your in-class work and transferring it to your personal computer.

**Fundamentals for Success in this Course**

We will make every effort to help you succeed in this course so that you can use ArcGIS 10.6.1 confidently and successfully in your future career endeavors. Naturally, it is your responsibility to complete all assignments and to take advantage of the many learning opportunities this semester. Your final grade will reflect your overall commitment to learning; highest grades correlate with student efforts that exceed average expectations. Here are some tips to help you succeed this semester:

- **Maintain a fast pace:** This will be a fast-moving and somewhat technologically advanced course, but concepts and instructions will be explained as clearly as possible. If you wish to evaluate your readiness for this course at the outset, please talk with us as soon as possible.

- **Computer competencies:** Competence with the Windows operating system is expected, including the storing, copying and management of multiple data types; managing multiple windows and applications; and techniques for saving work frequently. Familiarity with basic functionality of Microsoft Excel is also expected.
**Enjoyment of Learning:** A strong motivation to learn, explore and have fun with computer applications is essential. This course will require a significant amount of independent work and relies heavily on student initiative. A sense of humor with computer “headaches” is helpful, too!

**Seek Help Effectively:** Since GIS practitioners and urban planners are problem-solvers at their core, it is important that you adopt a problem-solving mindset in this course. Asking for assistance this semester is encouraged and signals to us that you are engaged in your work, motivated by excellence, and positively challenged by the assignments. Asking for help will **never** be perceived as a liability in our class. However, when seeking assistance, it is important for you to (1) clearly communicate the problem and (2) demonstrate that you have attempted to solve the problem on your own and are ready to clearly articulate your attempts.

Also, we are very happy to help you with your work outside of the classroom during office hours or via email. If we work together via email, it is vital that you send us as much information as possible to help diagnose the problem. It is **not** sufficient to write to us and vaguely state, “I can’t get this to work” and expect useful assistance without also including relevant screen captures and a description of the solution steps you’ve tried. In general, we will be very responsive to queries that meet these criteria and much less so for “lazy queries”, which we probably will not have the inclination to address quickly. This approach mirrors professional practice since supervisors expect valued employees to be proactive in solving problems.

**Focus and Respect:** We fully understand the temptations and distractions we all face today with smartphones vying for our attention, but lab computers may not be used for getting other work or email done. Out of respect for everyone in a focused learning environment, we will ensure that computers are only being used for course exercises. If you have to "get something else done" during the class period, please do it elsewhere. Phones need to be in silent mode, or turned off.

**Professional Conduct:** We conduct this course in a manner that mirrors professional practice in order to help you develop valuable workplace skills. We all need to be in agreement that the following standards will apply, as listed in the two sections below.

### Instructor Responsibilities

- To create a physically and intellectually safe and stimulating environment for learning
- To assist students as much as possible with their individual and collective learning goals
- To help resolve conflicts that hinder learning by answering student questions clearly and promptly, or to research answers and reply to the student as soon as possible
- To treat students with respect and kindness, using encouragement and humor to foster learning
- To arrive at the start of each class session fully prepared and organized, with clear learning objectives and a schedule for the day’s tasks ready to go
- To evaluate and grade student work fairly and accurately while providing constructive feedback

### Student Responsibilities

- To attend each class session and to arrive punctually, bringing all needed materials
- To treat other students and the instructor with absolute respect, supporting fellow students whenever possible with their learning objectives, and minimizing distractions in class
- To complete all work on time and professionally according to the syllabus standards
- To fully read and understand all aspects of this syllabus and to carry out the requirements herein
- To actively and consistently participate in class discussions and question-and-answer sessions
- To demonstrate self-reliance and self-direction in setting and completing learning objectives
- To accept responsibility for working collaboratively in the learning process
Course Assignments and Grading Policy

Your grade for the course will be based on the following assignments and other components. All relevant materials and assignment details will be posted to Canvas.

<table>
<thead>
<tr>
<th>Assignment (assignment descriptions follow this table)</th>
<th>Percent of Total Grade</th>
<th>Course Learning Objectives Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – GIS Data &amp; ArcGIS Desktop Basics</td>
<td>15%</td>
<td>1 – 5</td>
</tr>
<tr>
<td>B – Geocoding</td>
<td>20%</td>
<td>2, 4, 5</td>
</tr>
<tr>
<td>C – Geoprocessing</td>
<td>20%</td>
<td>2, 4</td>
</tr>
<tr>
<td>D – Choice of (1) City of Mountain View Mapping or (2) Independent Final Project. This assignment constitutes the 1-credit professional engagement unit.</td>
<td>25%</td>
<td>2, 4</td>
</tr>
<tr>
<td>Three Quizzes (each quiz will constitute 5% of the final course grade and will be completed in class.)</td>
<td>15%</td>
<td>1 – 6</td>
</tr>
<tr>
<td>Participation – Consistent, active, well-prepared, and measureable engagement in lectures and reading discussions, small team tasks, and presentations in class</td>
<td>5%</td>
<td></td>
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</tbody>
</table>

Assignment A will introduce students to GIS technology broadly, and ArcGIS software specifically, by completing readings at the Esri.com website and introducing the principles of working with geospatial data in ArcGIS. Students will complete chapters 1, 2, 4, 5, 6 and 9 in the course textbook. Also, students will practice the principles of thematic mapping as well as techniques for designing professional-looking maps. By so doing, they will prepare the type of demographic analysis maps commonly used by urban planners and build valuable workplace-ready skills. Lastly, students will conceptualize and execute tabular joins between multiple data tables, a common technique when working with U.S. Census data.

Assignment B covers the important core GIS skill of address geocoding. Students will learn fundamental geocoding data input requirements, limitations, and best practices and then geocode business addresses in a Bay Area community.

Assignment C introduces students to geoprocessing – the process of transforming geospatial datasets. Students will practice the basics using textbook guidance and then apply as many as eight tools to solving a series of queries modeled on real-world urban planning scenarios. Editing data will also be covered.

Assignment D will give students a choice of two options: (1) Replicate three maps that Prof. Kos produced as a GIS consultant to the City of Mountain View; or (2) Pursue an independent final project on a topic of interest to the student that includes a poster map, presentation to the class on July 2, and a concise methodological report. If this second option is chosen, a proposal for the independent project will be due Friday, June 21 by 9:00 p.m. for instructor review.

Either choice will allow students to apply the core GIS skills covered in previous lessons. Completion of Assignment D will fulfill the “engagement” component of the department’s four-credit course structure and is intended to cover the following learning objectives:
• Explain how practitioners utilize GIS to study municipal-level urban planning topics, store and maintain geospatial data, and prepare professional-grade maps for internal and public uses

• Contextualize the vital role of visual communication in the planning profession, specifically in terms of how digital maps can convey a great deal of information efficiently and effectively to various audiences including members of the public, elected officials, and peers

Extra Credit Assignment (due June 27) will be posted to Canvas around June 9 and will likely involve ArcGIS Pro – Esri’s eventual replacement to ArcGIS Desktop. Students completing this assignment with a grade of B or higher will be entitled to a half-step increase for a previous assignment grade (e.g. if a grade of B-minus was earned on a previous assignment, the grade on that assignment will be raised to a B.)

Calculation of Final Course Letter Grade
We will calculate the final letter grade for the course by weighting the grade for each assignment according to the percentages in the table above. To do this, we first convert the letter grade for each assignment to a number using a 4-point scale (A+ = 4.33, A = 4.0, A- = 3.67, B+ = 3.33, B = 3.0, B- = 2.67, C+ = 2.33, C = 2.0, C- = 1.67, D = 1, and F = 0).

We then use these numbers and the weights for each assignment to calculate a final, numerical grade for the course based on a 4-point scale. That number is converted back to a letter grade (A = 3.85+, A = 3.50 – 3.84, B+ = 3.17 – 3.49, B = 2.85 – 3.16, B- = 2.50 – 2.84, C+ = 2.17 – 2.49, C = 1.85 – 2.16, C- = 1.41 – 1.84, D+ = 1.17 – 1.40, D = 0.85 – 1.16, F = 0 – 0.84).

Final Examination or Evaluation
Assignment D, described earlier in the syllabus, will constitute the final examination for this course. The same assignment also serves as the one-credit professional engagement unit for this course.

Other Grading and Assignment Issues
High grades must be earned and all grades reflect our comprehensive estimation of a student’s effort - just as our efforts in a professional work environment are judged accordingly and considered by supervisors for promotions and pay raises. For example, we reserve a grade of “A” only for exceptional work, as a way of honoring students who go “above and beyond” when completing course assignments. After all, the strict definition of an “A” grade is “exceptional”, not “average” or even “above average”.

We will grade undergraduate level work (i.e. submitted by students in URBP-179A) more leniently than for the work submitted by graduate level (i.e. URBP-278) students. Typically, this will generally result in a half-grade difference; for example, an undergraduate student who earns a grade of B on an assignment will correlate with a grade of B- for a graduate student completing the same assignment with similar quality. This grading scheme will not always be followed strictly since upward adjustment of the final course grade will be made if performance on one activity is an outlier (e.g. exceptionally low) or if the pattern of scores shows a significant improvement. If such adjustments are made, they usually result in about a half-letter grade improvement. Students are encouraged to meet privately with us early in the semester to discuss expectations.

Opportunities for extra credit will be explained in individual assignment handouts that students can download from Canvas.

Course Workload
Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of
the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Because this is a four-unit class, students can expect to spend a minimum of ten to fifteen hours per week in addition to time spent in class and on scheduled tutorials or activities. Special projects or assignments will require additional work for the course. Careful time management will help you keep up with readings and assignments and enable you to be successful in all of your courses.

**Participation in Class and Attendance**

Student participation in class discussions is a vital component of this course and students should make every attempt to attend all classes and actively participate in discussions. In cases where a student misses a significant number of lectures or does not actively participate in discussions, this will impact the final course grade. According to University policy F69-24, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to ensure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

**Completing Assignments on Time and Professionally**

Assignments are due at the date and time specified on each assignment handout. In only rare instances will late assignments be accepted, as described below. Late assignments will receive a one-letter grade deduction for each day an assignment is late. For example, if the assignment would normally receive a grade of “B” but is submitted one day late, it will receive a final grade of “C”.

We realize that life happens. If you expect not to be able to complete an assignment on time, it is important for you to contact us at least 24 hours prior to the due date and, if appropriate, the other students in a group (for group project work). You must also provide a date and time by which the late assignment will be submitted. If you do not communicate an anticipated late assignment within this time frame or if the late assignment is not received on the date promised, the assignment will receive a grade of zero. The grading policies described earlier in the syllabus will still apply. A maximum of two late assignments that adhere to this policy will be accepted; all subsequent late assignments will receive an automatic grade of zero. Sorry, no exceptions to these policies will be granted, in fairness to the majority of students who submit their assignments on time.

Since this course focuses on the development of professional skills used by urban planners, the presentation of submitted materials will be considered as part of the assignment’s grade. All assignments must include the student’s name, date, course number, assignment number and other items as directed by the instructors. Neatness, clarity and organization do count. As in a professional setting, typed submissions are expected; handwritten assignments are not acceptable. Assignments not meeting these fundamental practices of professional presentation will generally receive a one-half to one-point deduction in the grade.

**University Policies**

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/
Plagiarism and Citing Sources Properly

Plagiarism is the use of someone else's language, images, data, or ideas without proper attribution. It is a very serious offense both in the university and in your professional work. In essence, plagiarism is both theft and lying: you have stolen someone else's ideas, and then lied by implying that they are your own.

Plagiarism will lead to grade penalties and a record filed with the Office of Student Conduct and Ethical Development. In severe cases, students may also fail the course or even be expelled from the university.

If you are unsure what constitutes plagiarism, it is your responsibility to make sure you clarify the issues before you hand in draft or final work.

Learning when to cite a source and when not to is an art, not a science. However, here are some common examples of plagiarism that you should be careful to avoid:

- Using a sentence (or even a part of a sentence) that someone else wrote without identifying the language as a quote by putting the text in quote marks and referencing the source.
- Paraphrasing somebody else's theory or idea without referencing the source.
- Using a picture or table from a webpage or book without reference the source.
- Using data some other person or organization has collected without referencing the source.

The University of Indiana has developed a very helpful website with concrete examples about proper paraphrasing and quotation. See in particular the following pages:

- Overview of plagiarism at www.indiana.edu/~istd/overview.html
- Examples of plagiarism at www.indiana.edu/~istd/examples.html
- Plagiarism quiz at www.indiana.edu/~istd/test.html

If you still have questions, feel free to talk to me personally. There is nothing wrong with asking for help, whereas even unintentional plagiarism is a serious offense.

Citation style

It is important to properly cite any references you use in your assignments. The Department of Urban and Regional Planning uses Kate Turabian’s *A Manual for Writers of Research Papers, Theses, and Dissertations*, 8th edition (University of Chicago Press, 2013, ISBN 780226816388). Copies are available in the SJSU King Library. Additionally, the book is relatively inexpensive, and you may wish to purchase a copy.

Please note that Turabian’s book describes two systems for referencing materials: (1) “notes” (footnotes or endnotes), plus a corresponding bibliography, and (2) in-text parenthetical references, plus a corresponding reference list. **In this class, students should use the “notes” style** since we feel that it creates a less visually distracting experience for your reader than the parenthetical-reference style.

Library Liaison

The SJSU Library Liaison for the Urban and Regional Planning Department is Ms. Peggy Cabrera. If you have questions, you can contact her at peggy.cabrera@sjsu.edu or 408-808-2034.

About the Instructor: Rick Kos, AICP

I am very much looking forward to working with you this semester and expect that you will learn quite a bit in our five short weeks together. We’ll have some fun along the way, too. My goal is to teach you
introductory GIS skills clearly, with minimal jargon and maximum time using the software to help you remain competitive in today’s labor market.

Throughout my career using GIS, I have never strayed far from my roots in urban and regional planning and this combination of experience is what I am excited to share with you. I take pride in providing personal, one-on-one attention to the needs of my students and strongly encourage you to take advantage of all opportunities to meet with me during class and during office hours.

My formal training is in environmental planning and urban design (B.S., Rutgers University, 1985) as well as regional planning and New Urbanism (Masters, University of North Carolina at Chapel Hill, 1995). In the late 1980s, I worked as a planner in Middlesex County, New Jersey, reviewing subdivision and site plan proposals for compliance with county regulations. In the 1990s, I served two rapidly growing North Carolina municipalities in a dual role as town planner and GIS coordinator (the latter being a role I created for both towns), so I am equally conversant in the language of both disciplines. From 1996 - 2000, I served as Senior Town Planner for Huntersville, North Carolina, the fastest-growing town of its size in the state at the time. The New Urbanist principles mandated by the Town’s development regulations applied to both greenfield and infill sites. Since the regulations were design-based (i.e. non-Euclidean), they required me to make frequent subjective judgments on the visual qualities of streets, the orientation of proposed buildings to public spaces, and the relationship of buildings and land uses to one another. I thoroughly enjoyed defending the principles of traditional town planning, often to developers and citizens that were not particularly receptive to deviations from the conventional suburban planning model.

After relocating to the Bay Area in 2000, I worked with the Metropolitan Transportation Commission in Oakland as a GIS Analyst. The Bay Area Lifeline Transportation Map that I completed for MTC was chosen from among thousands of entries for inclusion in Esri’s 2003 Map Book. This annual publication showcases innovative uses of Esri’s GIS software to solve real-world problems. The Lifeline Map locates disadvantaged neighborhoods and thousands of geocoded essential destinations (e.g. grocery stores, daycare centers, clinics) within the nine county region, along with existing public transit services. The spatial analyses enabled by this mapping work allowed transportation planners to locate gaps in transit service so that decision-makers could direct funding to alter bus schedules, connections, and routing for improved neighborhood connectivity.

From 2003 to 2007 I served as GIS Manager for Design, Community & Environment, a planning and design firm in Berkeley. I managed all aspects of the firm's GIS practice and took great pride in keeping hundreds of data layers organized across multiple projects, ensuring that the firm's metadata was up-to-date, training staff to use ArcGIS and ArcCatalog, and managing the production of hundreds of maps for General Plans and EIRs throughout California.

Hmmm…what else? I manage the GIS Education Center for a regional non-profit organization called BayGeo. Also, I have co-authored a book titled GIS for Economic Development with Professor Mike Pogodzinski of the SJSU Economics Department, released in late 2012 by Esri Press. I also engage in a number of freelance GIS projects, including transit planning analyses for Mobility Planners, LLC.

This will be my twelfth year teaching at San José State and, I must admit, it is my favorite job of those listed above. Welcome! Let’s work hard and have fun learning about GIS. I’m here to help you succeed.

About the Instructor: Ben Schuster, MUP

My GIS journey began almost exactly five years ago in this very classroom as a student in Rick’s Introduction to GIS course. Over the past five years, I’ve experienced firsthand the value of having strong
GIS skills. The tools I gained in this classroom have opened many awesome opportunities that I otherwise would not have been competitive for.

Today, I work for the City of San Jose Department of Transportation where I am currently undertaking a comprehensive overhaul of the department’s GIS data management practices. Previously, I worked as a long-range planner for the County of San Luis Obispo and have also had the opportunity to work on a number of freelance GIS projects for several consulting firms.

I am very excited to return to this classroom as a co-teacher with Rick as we explore the world of GIS together.
The following course outline describes the general approach we will take this semester, but please bear in mind that specific details are subject to change with reasonable notice. We will communicate changes via email or verbally in class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics/Quizzes</th>
<th>Assignment/Reading/Video Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues. June 4</td>
<td><strong>Skill Set 1: ArcGIS 10.6.1 Basics</strong>&lt;br&gt;Let’s go! ArcGIS menus and tools, downloading data, preparing data for mapping, creating geodatabases. Unimaginably fun.</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td><strong>Reading 1: “GIS Best Practices: GIS for Urban and Regional Planning” (skim)</strong></td>
<td><strong>Video 1 (GIS Data)</strong> and <strong>Video 2 (Thematic Mapping)</strong></td>
</tr>
<tr>
<td>Thurs. June 6</td>
<td><strong>Skill Set 2: Working with Different Geospatial Data Types</strong>&lt;br&gt;Working with thematic/categorical maps, joining data to maps, working with attribute tables, using U.S. Census data in ArcGIS.</td>
<td><strong>Reading 2: “Making Maps People Want to Look At”</strong>&lt;br&gt;<strong>Assignment A Due</strong>&lt;br&gt;<strong>Text Chaps. 1, 2, 4, 5, 6, 9</strong>&lt;br&gt;<strong>Video 4 (Attribute Tables)</strong> and <strong>Video 5 (Queries)</strong></td>
</tr>
<tr>
<td>Tues. June 11</td>
<td><strong>--- QUIZ #1 ---</strong> <strong>GIS and ArcGIS Basics</strong></td>
<td><strong>Reading 3: Peterson Chapters 1-3 (skim)</strong></td>
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<td></td>
<td><strong>Skill Set 3: Attribute and Spatial Queries</strong>&lt;br&gt;The real power of a GIS – using tabular and location information to solve specific spatial questions.</td>
<td><strong>Video 6 (Geocoding Addresses)</strong></td>
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<td><strong>In-Class Practice:</strong> Executing attribute and spatial queries using Mountain View geospatial data</td>
<td><strong>Video 7 (Georeferencing)</strong></td>
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<td>Thurs. June 13</td>
<td><strong>Skill Set 4: Geocoding and GPS Point Mapping</strong>&lt;br&gt;Turn addresses and latitude/longitude coordinate pairs into points on maps, thus enabling geospatial analysis. Magical and fun!</td>
<td><strong>Reading 3: Peterson Chapters 1-3 (skim)</strong></td>
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<td><strong>In-Class Practice:</strong> Geocoding locations of Mountain View stores</td>
<td><strong>Video 6 (Geocoding Addresses)</strong></td>
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<td><strong>Skill Sets 5 and 6: Map Projections and Georeferencing</strong>&lt;br&gt;Coordinate systems and map projections underlie all geospatial analysis and thus we need to cover it. Next, we will practice georeferencing by giving “new life to historic maps” – totally cool.</td>
<td><strong>Video 7 (Georeferencing)</strong></td>
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--- QUIZ #2 --- Attribute/Spatial Queries; Geocoding; Georeferencing

Skill Set 7: Geoprocessing (Part 1)
Baking bread is a process – you undertake a series of steps to convert raw ingredients to delicious bread. Similarly, geoprocessing implements specific processes to transform GIS data into new information. We’ll cover Model Builder, too – representing geoprocessing using an executable flow chart. Geek out!

In-Class Practice: Mt. View geoprocessing queries

Introduction to Final Course Project Options (Assignment D)
Students will choose one option: (1) Replicate three maps that Prof. Kos produced as a GIS consultant to the City of Mountain View; or (2) Pursue an independent final project that includes a poster map, presentation to the class on July 2, and a concise methodological report. A proposal for the independent project will be due Friday, June 21 by 9:00 p.m. for instructor review.

Reading 4: Peterson Chapters 4 (skim)

Assignment B Due
( Geocoding Addresses )

--- QUIZ #3 --- Geoprocessing and Editing

Skill Set 8: Editing in ArcGIS
How do you create new data “from scratch” in ArcGIS? How do you edit tables and map features? Let’s find out.

In-Class Practice: Practice with editing map features and tables

Reading 5: Peterson Chapters 5 (skim)

Assignment C Due
( Geoprocessing and Editing )

Reading 6: Peterson Chapters 6-7 (skim)

Video: 3 (Presenting GIS Data)

Reading 7: "Using Visualization Techniques for Enhancing Public Participation in Planning and Design"

Optional Extra Credit Assignment Due

Assignment D Due*
( Mountain View Mapping or Independent Final Project )

*T his assignment constitutes the one-unit "professional engagement unit" for this course and is, essentially, the final exam for the course. Given the compressed summer semester schedule, the instructors may permit Assignment D submittals as late as 8:00 p.m. on July 11, 2019. A final decision on this option will be announced in class.