

URBP 179/279: Advanced GIS for Planners

A combined upper-level undergraduate and graduate-level GIS course
in the Department of Urban and Regional Planning at San José State University
Spring Semester 2008

Course Details

- ◆ Class is held on Mondays, 7:15 pm to 10:00 pm in WSQ 208
- ◆ Instructor: Rick Kos, AICP
- ◆ Office Hours: Monday, 3:00 pm - 7:00 pm in WSQ 216G, or by appointment
- ◆ Email (*preferred method of contact*): rickkos@mindspring.com
- ◆ Department Phone: (408) 924-5882 Fax: (408) 924-5872
- ◆ Course web site: <http://gis-planning-applications.pbwiki.com>

Course Catalog Description

URBP 179: 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 279: Further examination of advanced geographic information systems applications to urban planning.

Course Overview and Learning Objectives

This combined undergraduate/graduate course builds upon the introductory GIS course offered in the fall semester. It is taught primarily through computer laboratory exercises supplemented by lectures, guest speakers and discussion. We will use intermediate and advanced features of ESRI's ArcGIS software - including a number of specialized extensions including Spatial Analyst and 3-D Analyst - to address current, real-world urban planning issues. The primary learning objectives for the course are:

- (1) Develop the intermediate to advanced GIS skills sought by today's employers
- (2) Engage in collaborative analysis of a real-world urban planning issue using GIS
- (3) Develop targeted, efficient and responsive GIS project management skills
- (4) Produce a complete geodatabase and metadata for the primary course project
- (5) Develop advanced cartographic techniques for the effective display of geospatial data
- (6) Produce a professional report and data analysis that demonstrate student GIS capabilities

The course will model a professional consultant-client relationship and emphasize project management skills that are fundamental not only to GIS projects but to any endeavor defined as a project. An instructor with the Project Management Institute will set the foundation for this aspect of the course. Using these skills, we will first provide GIS mapping services to students in the URBP 260 (sustainability) course in preparation for their study of the Alum Rock/Capital Expressway neighborhood. Next, we will enter into a study with the San José Planning Department staff as part of the city's ongoing General Plan update process. We will conduct detailed land use analyses in three major corridors that the city is targeting for a high-density, mixed-use, transit-supportive future. The course lectures and exercises will allow students to apply new GIS skills to the study of

these corridors, culminating in (1) the development of a project geodatabase and metadata, (2) delivery of an interactive mapping application to the city's planning department, and (3) the presentation of findings to city staff late in the semester.

Students will work in problem-solving teams to analyze the study corridors and apply project management skills by setting milestones, determining deliverables, and engaging in professional communications with city staff. We will work with the same GIS data used by the city and produce maps with a high degree of cartographic quality, guided by a specialist in cartography who is scheduled to visit the class in April. Throughout the semester, you will be encouraged to think about integrating GIS into your other coursework and, if applicable, to your Master's project.

Prerequisites

- ◆ Students are expected to have prior experience with ArcGIS, including the ability to perform basic attribute and spatial queries and the ability to produce a simple, cartographically-correct map using multiple geospatial data layers. Self-study using the "Getting to Know ArcGIS" textbook (not required for this course) is strongly recommended for students wishing to brush up on the fundamental GIS skills expected for participation in this course.
- ◆ This will be a fast-moving and technologically-advanced course. If a student wishes to evaluate his or her level of GIS experience prior to beginning this course, please contact the instructor as soon as possible.
- ◆ Competence with the Windows XP operating system, including the storing, copying and management of multiple data types; managing multiple windows and applications; and techniques for saving work frequently.
- ◆ Familiarity with data entry, sorting, editing and report generation using Microsoft Excel.
- ◆ 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.

Required Textbooks

No textbook is required for this course. Readings will be distributed by the instructor in hard-copy format along with occasional readings from a variety of GIS and urban planning-related web sites. It is strongly recommended that *Getting to Know ArcGIS Desktop* (for ArcGIS 9.2) by Tim Ormsby, et. al. be purchased as a reference, especially for those students who need to review the fundamental GIS skills that are a prerequisite to this course. This textbook, when purchased new, comes with its own evaluation copy of ArcGIS 9.2.

Required Software: *ArcGIS 9.2 and Extensions*

- ◆ Notes: this software is installed on each lab computer. Also, each student will receive a free copy of ESRI's ArcGIS 9.2 software for use on his/her personal computer; it is a fully-functioning version and will expire one year after installation. Please note that ArcGIS software is optimized for Windows 2000 or XP and that Vista has presented some documented problems, most of which can be corrected by installing a Service Pack from ESRI. While some students have successfully used ArcGIS with Vista, it is strongly recommended that the optimized operating systems be used. In order to run ArcGIS in Windows on an Intel-based Mac, virtualization software is needed such as Apple's free BootCamp (available at apple.com), SWSoft's Parallels (\$79) or VMware Fusion (\$79).



Recommended Hardware and Software

The computer laboratory and mini-lab are available to students to complete in-class assignments and homework. If a personal computer is used to complete work started in class, a USB flash drive and/or a rewriteable CD-ROM is strongly recommended for saving files and transferring them to the personal computer. GIS data files can be large, so media with at least 2 GB of capacity are recommended. Some web-based services such as YouSendIt.com and TransferBigFiles.com provide free transfer of single files up to a certain size, usually 1 GB. Multiple data files can be consolidated into a single ZIP file prior to transfer.

To take full advantage of the course resources, each student should have access to a computer with an Internet connection and have access to the following software: Microsoft Internet Explorer (or Firefox), Adobe Acrobat Reader (available free at www.adobe.com), Microsoft Word, Microsoft Excel, Microsoft Powerpoint.

Course Outline

The course outline is subject to change with reasonable notice. Please visit the Syllabus page on the course web site regularly for updates and new information. Specific readings, exercises and assignments will be distributed to students by the instructor at the appropriate times during the semester.

January 28: Introductions, Syllabus Review, Software and Tutorial Data Preparations, GIS "Refresher"

February 4: Overview of Course Projects from our Clients

- ◆ Prof. Hilary Nixon: map production for URBP 260 student analysis of Alum Rock/Capital neighborhood
- ◆ Michael Brilliot, Senior Planner, San José Planning Department: land use maps for General Plan Update
- ◆ Guest Speaker: Michael Bills, Senior Planner, San José Planning Department: "The Business of GIS"

February 11: Project Management Training

- ◆ Guest Speaker: staff of the Project Management Institute

February 18: Collaborative Planning for Course Projects using Project Management Techniques

- ◆ Determination of scope, milestones and deliverables
- ◆ Assignment of duties; data collection responsibilities

February 25: GIS Database Management

- ◆ GIS data types and metadata
- ◆ Projections and building geodatabases
- ◆ In-class preparation of maps for URBP 260 students

March 3: Presentation of Alum Rock/Capital Maps to Professor Nixon; Geocoding Lecture and Practice

March 10: Introduction to ArcGIS 3-D Analyst Extension and ArcGlobe

March 17: Introduction to ArcGIS Spatial Analyst Extension

March 24: NO CLASS (Spring Recess)

March 31: NO CLASS (César Chávez Day)

April 7: Introduction to ArcGIS Network Analyst Extension; City Staff Visit for Progress Report

April 14: Guest Speaker: Larry Orman, Director, GreenInfo Network - Cartographic Techniques

April 21: Advanced Geoprocessing and ArcGIS Model Builder

April 28: EXAM

May 5: In-Class work on Maps and Analysis for San José Corridor Study

May 12: Preparing Maps and Data for Publication and Remote Viewing using ArcPublisher and ArcReader

May 19: Presentation of Maps and Findings to San José Planning Department Staff

Grading

Final grades will be determined by student performance in the following weighted areas:

20%	ArcGIS Learning Exercises
15%	Client Deliverable #1: Maps of the Alum Rock/Capital neighborhood for URBP 260 students
15%	Exam
30%	Client Deliverable #2: Maps and Analysis for San José Planning Department
10%	Presentation of Final Project Results to San José Planning Department staff
10%	Engagement in Class: participation in discussions, assisting other students, project team support
100%	Total

This scheme will not be followed in an overly strict manner. For example, upward adjustment of the final grade will be made if performance on one activity is an outlier (e.g. exceptionally high) 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. Grades on student work will be assigned as follows:

90% and above	A	69%-62%	C
89% - 87%	A-	61%-60%	C-
86%-83%	B+	59%-55%	D+
82%-78%	B	54%-52%	D
77%-73%	B-	51%-50%	D-
72%-70%	C+	Below 50%	F

Participation in Class and Attendance

Student participation in class discussions is a vital component of this course. There is no formal course credit for participation, however, students should make every attempt to attend all classes and actively participate in discussions. In rare 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."

Assignments

Assignments are due at the time specified by the instructor. Due to the nature of this course, no late assignments will be allowed. If a student expects not to be able to complete an assignment on time, it will be important for the student to contact the instructor and, if appropriate, the other students in a group (for group project work). A project-based course such as this one depends on the reliability of all students.

University, College or Department Policies

◆ Academic integrity statement (from Office of Judicial Affairs)

SJSU's Policy on Academic Integrity states: "Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Judicial Affairs". The policy on academic integrity can be found at <http://www.sjsu.edu/senate/S07-2.htm>

◆ Plagiarism and Proper Citation of Sources

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 on either draft or final work handed in to your instructor will lead to grade penalties and a record filed with the SJSU Office of Judicial Affairs. It may also result in your failing the course. If you are unsure what constitutes plagiarism, it is your responsibility to make sure you clarify the issues before you hand in written work. Faculty will from time to time submit student work to Turnitin.com to check for plagiarism.

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:

- If you use a sentence (or even a part of a sentence) that someone else wrote and don't identify the language as a quote by putting the text into quote marks and referencing the source, you have committed plagiarism.
- If you paraphrase somebody else's theory or idea and don't reference the source, you have committed plagiarism.
- If you use a picture or table you found in a web page, book, or report and don't reference the source, you have committed plagiarism.
- If your paper incorporates data someone else has collected and you don't reference the source, you have committed plagiarism.

San José State University has created a website tutorial on how to identify and avoid plagiarism that students are encouraged to visit. The site is available at <http://tutorials.sjlibrary.org/tutorial/plagiarism/index.htm>. In addition, the "Academic Dishonesty Procedures" are available in any SJSU Schedule of Classes.

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*, 7th

edition (University of Chicago Press, 2007, ISBN-10: 0-226-82336-9). Copies are available in the SJSU King Library. Additionally, the book is relatively inexpensive, and you may wish to purchase a copy (\$11.56 recently listed at amazon.com). Please note that Turabian's book describes two systems for referencing materials: (1) footnotes or endnotes, plus a corresponding bibliography, and (2) in-text parenthetical references, plus a corresponding reference list. Either system is fine, but you need to be consistent with your referencing style.

If you still have questions after reading this section, feel free to talk to your advisor. There is nothing wrong with asking for help, whereas even unintentional plagiarism is a serious offense.

◆ **Campus policy in compliance with the Americans with Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with the instructor as soon as possible, or visit during office hours. Presidential Directive 97-03 requires that students with disabilities register with the Disability Resource Center (DRC) to establish a record of their disability. Students requesting accommodation of disabilities must do so through the DRC at <http://www.drc.sjsu.edu/> or by calling (408) 924-6000. Accommodations will be provided only to those students who are registered with the DRC, and who have requested accommodation pursuant to policies of the DRC.

◆ **Academic Honesty**

Faculty will make every reasonable effort to foster honest academic conduct in their courses. They will secure examinations and their answers so that students cannot have prior access to them and proctor examinations to prevent students from copying or exchanging information. They will be on the alert for plagiarism. Faculty will provide additional information about other unacceptable procedures in class work and examinations. Students who are caught cheating will be reported to the Judicial Affairs Officer of the University, as prescribed by Academic Senate Policy S04-12.

◆ **Eating**

Eating and drinking (except water) are prohibited in the classroom. Students with food will be asked to leave the building. Students who disrupt the course by eating and do not leave the building will be referred to the Judicial Affairs Officer of the University. There will be at least one, short scheduled break during the class period during which you may eat or drink in the appropriate locations near the classroom.

◆ **Cell Phones & Other Audible Devices**

Students will turn their cell phones and other audible devices off or put them on vibrate mode while in class. They will not answer their phones in class. Students whose phones disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University. There will be at least one, short scheduled break during the class period during which students may take calls outside of the classroom.

◆ **Computer Use**

Using your laboratory computer during class time for non-course related activities is disrespectful and distracting to the instructor and to your fellow students. In the classroom, faculty allow students to use computers only for class-related activities. These include activities such as taking notes on the lecture underway, following the lecture on web-based PowerPoint slides that the instructor has posted, and finding

Web sites to which the instructor directs students at the time of the lecture. Students who use their computers for other activities or who abuse the equipment in any way, at a minimum, will be asked to leave the class and will lose participation points for the day, and, at a maximum, will be referred to the Judicial Affairs Officer of the University for disrupting the course. (Such referral can lead to suspension from the University). Students are urged to report to their instructors computer use that they regard as inappropriate (i.e., used for activities that are not class related).

Odds and Ends

◆ Adds/Drops

The student is responsible for understanding the policies and procedures about add/drops, academic renewal, withdrawal, etc. found at <http://www2.sjsu.edu/senate/S04-12.pdf>

◆ Incomplete Grade

An incomplete grade will only be assigned for a documented, serious, non-academic reason.

◆ Students Adding the Class after the First Day of Class

Students who add the class after the first day of class are responsible for completing all work in the course on the same schedule as students who were registered from the first day of the semester.

◆ Level of Effort

This course requires 2 to 3 hours of study for each hour of lecture. This works out to between 5 and 7.5 hours per week, not including class time.

About the Instructor: Rick Kos, AICP

I am very much looking forward to working with you in the GIS Planning Applications course and expect that you will learn quite a bit in one semester. We'll have some fun along the way, too. My goal is teach you some intermediate and advanced GIS skills clearly, with minimal jargon and maximum time using the software. 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.

A little about my background: my formal training is in environmental planning and urban design (B.S., Rutgers University) as well as regional planning and New Urbanism (Masters, University of North Carolina at Chapel Hill). 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, at first, to deviations from the conventional suburban planning model.

After relocating to the Bay Area in 2000, I worked with the Metropolitan Transportation Commission 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 9-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.

Recently, I served as GIS Manager for Design, Community & Environment, a 45-person 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 numerous maps for General Plans and EIRs throughout California.

Currently, I am a digital cartographer with WorldLink, based in the Presidio of San Francisco. I am helping to create an engaging software program called Interactive Earth that is designed to excite school-age children about geography and in becoming world citizens. I am also an instructor with the GIS Education Center affiliated with City College of San Francisco.