

COURSE SYLLABUS

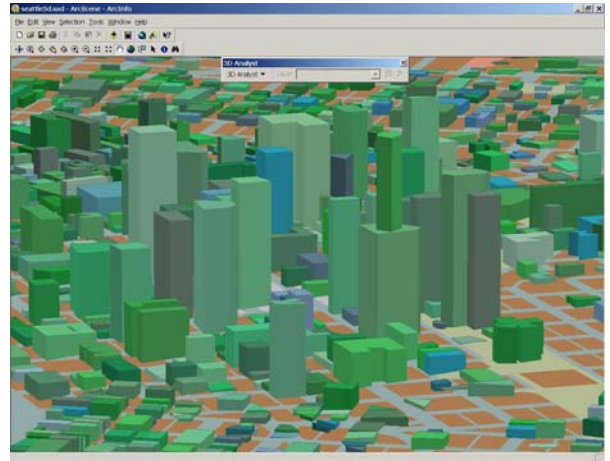
Urban Affairs and Planning: Computer Applications

Course Information

Meets: Monday 7 to 9 p.m.
Where: 101 AA

Contact Information

Instructor: Lisa Schweitzer
Office: 205 AA
E-mail: lschwei@vt.edu
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Office Hours: By appointment
<http://www.appointmentquest.com/provider/2070075227>



Course Objectives

This course provides you with an understanding of how geographic information systems can be used to answer questions and solve problems encountered by planners, policy analysts, and researchers. In this course, you will:

- Be introduced to the basic concepts, structures, and functions used in geographic information systems.
- Learn how to apply the techniques of GIS to a wide array of planning and policy-related issues.
- Learn how to effectively disseminate the results of GIS analysis, through both written and verbal communication.

The course will rely extensively on lab-based demonstrations and exercises. We will use the ArcGIS software throughout this course.



Learning Objectives

By the end of the class, you will:

- (1) Demonstrate understanding of basic concepts of GIS design and structure including fundamental concepts of cartography and spatial thinking, GIS data structures, base files, measurement, input, storage, editing, output, and display.
- (2) Demonstrate understanding of the concepts and application of spatial measurement, analysis, and classification, network analysis, and overlay analysis.
- (3) Apply these concepts and methods to analysis of data using ArcGIS software and to development of a research design for answering a spatial planning, policy analysis, or other research question.

Course Format

The class will be conducted as a lecture/discussion session with online, self-directed computer labs. I envision the first part of each week being devoted to lecture and discussion and the last half to focus on student work and discussion. Lectures and discussions will build upon assigned readings; thus full preparation prior to each class session is essential, both to the value of the class to you and to your performance evaluation for the course. Lab demonstration sessions are intended to introduce and demonstrate GIS concepts and applications. **You will need to spend additional lab time outside class to complete the work.**

Please arrive for class on time and do not disrupt the formal lecture and discussion portions of the class by getting up and leaving unless it is absolutely essential. If you must arrive late or depart early, please do so with minimal disturbance. Please respect whomever is speaking by not talking to others and not engaging in computer work during class discussions. Please adhere to university rules that prohibit consumption of food or beverages in classrooms.

Course Materials

There are required texts for this course. The textbooks are available at the bookstore.

Ormsby et al. 2004. *Getting to Know ArcGIS Desktop, Second Edition Update for ArcGIS 9*. Environmental Systems Research Institute (ESRI). (includes CD-ROM). Note: Be sure to get this edition of the text.

Bolstad, Paul. 2002. *GIS Fundamentals: A First Text on Geographic Information Systems*. Elder Press. (Note: The more recent edition is also fine.)

Mitchell, Andy. 1997. *Zeroing In: Geographic Information Systems at Work in the Community*. ESRI.

Course Requirements

Course requirements include (1) active participation in class discussions; (2) preparation 2 synopses of GIS application cases; (3) completion of 10 lab exercises; (4) completion of three problem memo assignments; (5) completion of a research design that employs GIS analytic methods including (a) a formal proposal, (b) a final research design poster and (c) website.

Synopses summarize the variables, data, methods, findings, and conclusions of assigned readings that describe the application of specific GIS techniques to answer specific planning, policy analysis, or research questions. These should be about 1.5 pages in length.

The *research poster and website* will focus on an analysis/research problem that is grounded in the scholarly and professional literature of planning or your field if you are not a planning student. Additional detailed instructions will be distributed.

Grading

All work is to be handed in to my flat file and time-stamped by 5 o'clock pm on the due date. If you turn your work in late, I will not grade it. I have reasons for this; in the world in which most planners live, deadlines matter a lot. A grant proposal may take you a month or more to write: if it's turned in at 3:05 PM instead of 3:00 PM, it's worthless and nobody will consider it. The habits you develop around deadlines now will determine how well you manage your time later.

Grades will be based on attendance, class participation, preparation of synopses, review paper and presentation, the lab assignments, lab practicum assignments, and the research proposal and poster/website.

Attendance at all classes is not required, but strongly recommended, and **three unexcused absences will result in failure**. This doesn't mean you have a three free skips. It means you can miss three classes before I become convinced you don't want to learn this and I fail you.

The following and only the following absences are eligible to be excused: religious holidays, as specified in VT policy; absences due to representing VT at official functions, including intercollegiate debating or varsity sports events; and verified emergencies and/or illness. While one is not penalized per se for excused absences, s/he is nevertheless responsible for all content missed, including any assignments, knowledge, or skills covered or assigned.

Class participation grades will be based on preparation and active participation in all aspects of class discussion.

Synopses will be graded on a satisfactory/unsatisfactory basis. They are primarily used to stimulate class discussion of real-world applications of GIS.

Lab assignments will be graded on a 100-point scale. Points will be deducted for incorrect, incomplete, or late (see below) lab reports.

Research design proposals and papers will be graded using a plus/minus letter grade scale (A+, A, A-, etc.). Grades will reflect organization, grammar, and spelling as well as content.

<u>Task (s)</u>	<u>Weight</u>
Class participation	100 pts
Synopses (2)	100 pts
Research design proposal	200 pts
Research design poster	300 pts
Website	300 pts
Lab exercises (10)	250 pts
Group assignment (1)	200 pts
Problem memos (3)	300 pts

All assignments are due at 5:00 pm on the due date. **All assignments are to be time-stamped and turned in to my flat file upstairs, unless I specify the Digital Dropbox. Assignments must be**

submitted in hard copy by the deadline noted on the attached schedule, unless I give you **explicit** alternative directions.

Extensions for individual assignments or a grade of incomplete in the course will only be granted for severe hardship (death in family, illness or injury requiring bed confinement) or extenuating circumstances (fire, earthquake, etc.).

Competing pressures from other courses, job requirements, or problems with your personal computer do not qualify as extenuating circumstances (**back up your files!**).

Incompletes will have explicit deadlines that will only be extended under extreme circumstances.

Academic Honor Policy

1. I use Turnitin.com, and I will use it if I think you are cheating. If you have any questions about what constitutes academic dishonesty, please refer to the VT website on the honor code points on plagiarism: <http://www.english.vt.edu/~IDLE/plagiarism/plagiarism1.html>.
2. I will turn you in to the Honor Court, per our university regulations. You will receive a double-weighted zero on the assignment, which probably means you will fail the entire class. Don't test me.
3. If you need clarification, you can bring up any questions you have about plagiarism or the VT honor code. The undergraduate honor code may be found at:
<http://www.honorsystem.vt.edu/Frame01.html>.
4. If you have a disability that entitles you to accommodation, please inform me as soon as possible during my office hours or outside of class. I am happy to assist; Virginia Tech's services for students with disabilities can be found at <http://www.ssd.vt.edu/supportservices>.

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Schedule of Readings and Assignments*

Dates	Lecture Topic(s)	Readings	Lab work	Assignment Handed Out	Assignment Due Date
Week 1 1/22-1/26	<p>No Class on Jan 24th (TRB)</p> <p>Lecture downloadable</p> <p>Introduction;</p> <p>Basic GIS concepts and context;</p> <p>Introduction to COSS GIS Lab and ArcGIS</p>	<p>-Bolstad, Chapter 1, - <i>Getting to Know ArcGIS</i> (GTKAG), pp. 1-18</p>		<p>-Lab #1</p> <p>-Synopsis #1</p> <p>-Research design instructions (download from Blackboard)</p>	
Week 2 1/29-2/2	<p>Cartography and Spatial Thinking; Map Output</p>	<p>-Bolstad, Ch.2: 25-30; Ch.4: 111-120</p> <p>- <i>Getting to Know ArcGIS</i> (GTKAG), pp. 1-18</p> <p>- Monmonier Reading on Blackboard site</p> <p>-Mitchell, Chapter 2</p>	<p>Lab #1: Introduction to ArcGIS</p>		
Week 3 2/5-2/9	<p>Geographic referencing systems</p>	<p>-Bolstad, Chapter 3</p> <p>-Mitchell, Chapter 4</p>	<p>Lab #2: Cartography & symbolizing features</p>	<p>-Lab #2</p> <p>-Synopsis #2</p>	<p>-Lab #1</p> <p>-Synopsis #1</p> <p>2/9</p>
Week 4 2/12-2/16	<p>GIS data structures, queries, and storage</p>	<p>-Bolstad, Chapter 2, Chapter 8</p> <p>-Mitchell, Chapter 6</p>	<p>Lab #3: Joining & relating tables; digital data representation</p>	<p>-Lab #3</p> <p>Problem memo 1</p>	<p>-Lab #2</p> <p>-Synopsis #2</p> <p>2/16</p>
Week 5 2/19-2/23	<p>GIS data: collection and base files</p>	<p>-Bolstad, Chapter 7</p>	<p>Open lab</p>	<p>-</p>	<p>-Lab #3</p> <p>2/23</p>

Dates	Lecture Topic(s)	Readings	Lab Session	Assignment Handed Out	Assignment Due Date
Week 6 2/26-3/2	GIS data: input	- Bolstad, Chapter 4 - Mitchell, Chapter 9 & 11 - Huxhold reading on Blackboard	Lab #4: Data input and base files	-Lab #4	Problem Memo 1 3/2
-Spring Break					
Week 7 3/12-3/16	GIS data: editing Peer Review Exercise (2/23)	- Bolstad Chapter 4	Lab #5: Digitizing, event themes, and geocoding	-Lab #5 -Group assignment	-Lab #4 3/16 - Research design proposal (to hand in)
Week 8 3/19-3/23	Classification and Reclassification	- Bolstad, Chapter 9	Lab #6: Data editing and output	-Lab #6 -Research design proposals returned	-Lab #5 3/23
Week 9 3/26-3/30	Spatial measurement and proximity analysis	- Bolstad, Chapter 9 Mitchell Chapters 3, 5	Lab #7: Classification	-Lab #7	-Lab #6 3/30 -Group assignment
Week 10 4/2-4/6	More spatial measurement; comparing variables among coverages	- Mitchell, Chapters 8, 10	Lab #8: Spatial measurement, proximity analyses, and buffers		-Lab #7 4/6
Week 11 4/9-4/13	Comparing variables among coverages (cont); network analysis	- Song, et al (1998) reading on Blackboard site	Lab #9: Theme-on-theme, overlay, and network analysis	- Lab #8 - Problem memo 2	-Research posters ready for pinup 4/16 -Problem memo 2 4/13a

Week 12 4/16-4/20	Statistical surfaces Pin ups of your drafts		Lab #10: 3-D Analyst applications	- Lab #9 - Problem Memo 3	- Lab #8 4/20
Week 13 4/23-4/27	Special Applications: GPS GPS Field Work	Bolstad, Chapter 5		Lab 10	- Lab #9 4/27 Problem memo 3 Final research
Week 14 4/30-5/4	Presentations of final posters in gallery				- Lab 10 - Final web page 5/4

**Note: This schedule is subject to revision if Dr. Schweitzer feels like it.*