GEO242: Geographic Information Systems II
Winter 2010-2011 | DePaul University | Department of Geography

1. Meeting
Time: Tues/Thurs 11:20-12:50 pm
Location: Schmitt Academic Center 224 (GIS Lab), Lincoln Park Campus (LPC)

2. Instructors
Sungsoon (Julie) Hwang
- Contact: shwang9@depaul.edu, (773) 325-8668
- Office: Room# 4513, 990 W Fullerton Ave, LPC
- Office hour: Mon/Wed 2-3 pm or by appointment

Neil Loomis (Lab assistant): contact him via an e-mail: neil5790@gmail.com. He will be in GIS lab during his lab hours to be announced.

3. Course Description

GEO242 is an intermediate-level GIS course. Students conduct **real-world GIS projects** for community-based organizations (CBO) in Chicagoland. Topics include data capture, data manipulation, database design, data quality, and spatial analysis. Students will complete projects following best practices of GIS project management. Instruction is accomplished through lectures and hands-on computer lab exercises using ArcGIS (more specifically ArcInfo 10).

PREREQUISITE(S): GEO 241 or instructor consent.

4. Learning Goals

- Explore different ways in which **GIS** can/is used **in organizations**
- Learn concepts of **database design** for GIS applications
- Lean methods of **data input and editing** for GIS applications
- Develop an informed understanding of spatial **data quality**
- Learn methods of **spatial analysis** commonly used in GIS

5. Learning Outcomes

- Assess geographic information needs given organizational contexts in regard to implementing GIS (P1)
- Design GIS databases with entity-relationship modeling techniques (P2)
- Create geographic data on your own using appropriate tools (P3)
- Assess the fitness of use of geographic data for a given problem (P3)
- Recommend appropriate methods of spatial analysis when presented with geographic problems, and execute them appropriately (P4)

6. Course Text(s)
There is no text to buy. Required readings are posted as PDF files on the Desire2Learn course site.

7. Outlines of Topics & Tentative Schedules

Wk	Date	Topics	Labs	Project milestones
1	1/4	Course overview; *Meet with clients*		
	1/6	[M01] Project management	01.Statement of work	
2	1/11	[M02] GIS and organizations	02.Change mapping	P0 (Proposal)
	1/13	[M03] Needs assessment	03.Buffering & overlay	
3	1/18	*Community and CBO tours (TBD)*		
	1/20	[M04] Database design	04.Draw ERD	
4	1/25	[M05] Data capture (input)	05.GPS data import 06.Heads-up digitizing	P1 (Needs assessment)
	1/27	[M06] Data manipulation (editing)	07.Address geocoding 08.Rubber-sheeting	
5	2/1	[M07] Geodatabase *Meet with clients*	09.Create geodatabase	
	2/3	[M08] Data quality	10.Author metadata	
6	2/8	[M09] Data classification [M10] Data acquisition strategy	11.Prism (3D) mapping	P2 (System requirements)
	2/10	[M11] Vector spatial analysis	12.Aggregate mapping	
7	2/15	[M12] Raster spatial analysis	13.Suitability analysis	
	2/17	[M13] Spatial data infrastructure		
8	2/22	Project help		P3 (Data acquisition)
	2/24	Project help		
9	3/1	Project help		P4 (Data analysis)
	3/3	Map contest; Project help		
10	3/8	Project help		
	3/10	*Project presentation (P5)*		P5; P6 (Final report)
11	3/15	Final exam 11:45-2:00 pm		

8. Grading Scheme

Grading Breakdown	
Participation	**10 %**
Labs (each lab carries 2 points)	**26 %**
Project	**40 %**
Final exam	**24 %**

Grading Scale

A	= 93-100%	C+	=77-79.99%
A-	= 90-92.99%	C	=73-76.99%
B+	= 87-89.99%	C-	=70-72.99%
B	= 83-86.99%	D+	=60-69.99%
B-	= 80-82.99%	D	=50-59.99%
		F	=0-49.99%

Participation

In order to encourage effective participation I list detailed outlines of topics and assigned readings in Section 9. Whenever possible, use class time for verifying, and reinforcing answers that you have found while reading. I will evaluate your participation based on **preparedness**, enthusiasm, and attendance.

Labs

Labs are about mastering GIS skills. 10 out of 13 labs are concerned with developing intermediate-level skills in using ArcInfo 10. While adding to or refreshing skills learned from GEO241 (GIS I), relative emphasis will be placed on creating geographic data and conducting spatial analysis. Labs will be completed individually in class when instructors are present under most circumstances.

In case you couldn't complete the lab in class, (1) show up in GIS lab during Neil's lab hours when a lab assistant is present; (2) work in GEO lab (990 W Fullerton, Rm# 4515) during Julie's office hours; (3) email questions to instructors if you can't make it during lab/office hour; (4) do it on your own in places where GIS software is installed.

Project

You as a group of 4-5 persons will define and implement GIS project based on CBO's needs. Project consists of the following six milestones. Summary of tasks involved in each milestone is provided below:

- P0 (proposal): form a group, choose a project, and describe problems
- P1 (needs assessment): state goal, objectives, and describe information products
- P2 (system requirements): specify data and operational requirements
- P3 (data acquisition): acquire data suited to problems, and assess data quality
- P4 (data analysis): lay out plan for visualizing and analyzing data
- P5 (presentation): present results to clients
- P6 (final report): it should include introduction, needs assessment (P1), system requirements (P2), data acquisition (P3), data analysis (P4), results, and conclusions

Each group is required to submit milestone reports following tentative schedules (the rightmost column). Detailed guidelines for milestone reports will be provided in a timely fashion. Each milestone carries 4 points except for P0 (no points) and P6 (20 points). It is important that **feedback** provided for each milestone from P1 to P4 **is incorporated into P6**.

Each group will be given less than 15 minutes in each class for project meeting by the seventh week. It means that you need to **meet with group members outside of the classroom** during that period (1-7th week). Therefore, it is important that you work with group members who can minimize schedule conflict or set up viable communication channels (e.g., email, cell phone, skype, online forum in D2L, social media) if meeting in person is not amenable.

At the end of the quarter, you are required to **fill in peer evaluation form** – this is to avoid a potential free-riders problem. The peer evaluation form will be used to make adjustment to the final grade of individuals in the direction of either rewarding or penalizing individuals based on unanimous peer reviews backed by instructors' observation.

Six GIS projects have been collected from CBOs affiliated with DePaul's service-learning center, the Steans Center. See **Appendix A** for project descriptions. You will have several opportunities to meet with CBO representatives both in and outside of class, including the first meeting. See tentative schedules where meeting with clients are

shown in italic. If you can't attend the first class meeting, I suggest that you read Appendix A thoroughly and consult an instructor to gather information that you might have missed. Finally, you can propose your own project.

<u>**Final exam**</u>
There is one exam scheduled during a final exam week. The exam consists of a written part and practical part. The **practical part** tests your ability to use GIS software which will be mostly drawn from lab materials. The written test is a closed-book exam.

Late Work Policy: Late work will be accepted with 25% of the total grade deducted (for instance, 2 becomes 1.5) for each class being late. Extensions, if needed, should be requested via an instructor' consultation in a timely fashion, and can be granted at an instructor' discretion. This policy applies to labs and project.

Makeup Exam/Incomplete Grade Policy: A makeup exam or an incomplete grade can be arranged or granted only when credible dire and documented medical or family situations arise and these circumstances are communicated in a timely fashion.

Attendance/Absentee Policy: Consistent with university's policy, all students are expected to attend class meetings. Unless absence is explained on medical or compassionate grounds (documentation is required), absence from any classes is grounds for a grade adjustment.

9. Detailed Plan of the Class

PART I. DEFINING GIS PROJECT

Module 1: Project Management

- What are distinguishing characteristics of **project** (compared to operations)?
- Describe three **project management** functions – definition, planning, and control?
- What are characteristics of successful project?
- How to **define project**: describe sections included in the Statement of Work – purpose, scope, deliverables, and objectives – and write the **Statement of Work** for your GIS project in preparation for P0 and P1 (Lab1)
- How to **plan project**: describe how **Work Breakdown Structure** (WBS) works, and apply it to planning your GIS project, that is scheduling and assigning roles & responsibility to group members

  Verzuh. 2008 *The Fast Forward MBA in Project Management*. Wiley: 13-14, 21-24, 6-9, 60-68, and 125-142

Module 2: GIS and Organization

- Describe the **scope of GIS project** – single, departmental, and enterprise
- Describe the **process of GIS project** in relation to project's scope and organizational contexts (such as role of GIS in organization)
- How to rationalize GIS project: categorize the business case (**benefit**) for GIS
- Why GIS project fails: define GIS **implementation success**

Tomlinson. 2003. *Thinking About GIS*. ESRI Press: 1-17
Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 427-434
Obermeyer and Pinto. 2008. *Managing Geographic Information Systems*. The Guilford Press: 81-92

Module 3: Needs Assessment

- Describe different types of **users' requirements** – functional, data, processing, hardware and software, staff, training, procedures, legal, and organization and institution
- Why **functional** approach to needs assessment: understand how functional requirements are linked to other types of requirements
- Describe **hierarchical** approach to needs assessment (e.g., missions, functions, applications)
- Apply needs assessment techniques discussed by Huxhold to your project (P1)
- Describe the relationship between **data**, **information products** and **operations**, and apply that knowledge to your project (P1; P2)

Huxhold. 1992. Needs Assessment. In Brown and Moyer eds. *Multipurpose Land Information Systems: the Guidebook*. FGCC: 16-1~16-38

Module 4: Database Design

- Distinguish **three steps of database design** – conceptual, logical, and physical
- Describe **entity relationship model** as a conceptual modeling technique
- Describe **relational model** as a logical modeling technique
- Draw **entity-relationship diagram** using Chen model (Lab4)
- Describe how to **extend** relational model **to spatial data**, that is pictogram
- Design database for a given problem, and draw entity-relationship diagram using Crow feet model (P2)

Shekhar and Chawla. 2003. *Spatial Database: A Tour*. Prentice Hall: 34-45

PART II. IMPLEMENTING GIS PROJECT

Module 5: Data Capture

- Describe how geographic data is created from **primary** sources – digital photogrammetry, GPS data import, and COGO
- Create geographic data by **importing GPS track log** data to GIS (Lab5)
- Describe how geographic data is created from **secondary** sources – scanning and digitizing
- Create geographic data by **heads-up digitizing** (Lab6)
- Describe how geographic data is created from **attribute data** – geocoding and table join
- Create geographic data by **address geocoding** (Lab7)

Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 229-243

Module 6: Data Manipulation

- Describe what **coordinate transformation** is, and when it is used
- Distinguish methods of coordinate transformation: **similarity vs. affine**
- Edit/conflate geographic data using spatial adjustment tools (e.g., **rubber-sheeting**) (Lab8)
- Describe what **generalization** (or line simplification) is, and when it is used
- Describe **Douglas-Peucker algorithm**
- Recognize miscellaneous **data processing** operations (e.g.. merge, dissolve, clip, project, and centroid creation), and know how to do them in GIS

Bolstad. 2008. *GIS Fundamentals*. Eider Press: 146-155
Chrisman. 2001. *Exploring Geographic Information Systems*. Wiley: 94-97

Module 7: Geodatabase

- What is **geodatabase**, and what are three **primary dataset types** of geodatabase?
- Describe each of **building blocks** of geodatabase, including feature classes, raster datasets, tables, relationship class, topology, subtype, and domain
- Compare and contrast geodatabase and shapefile or describe **advanced capabilities of geodatabase** which are not supported in shapefile
- Create geodatabase by importing from shapefile (Lab9)

Arctur and Zeiler. 2004. *Designing Geodatabases: Case Studies in GIS Data Modeling*. ESRI Press: 1-35

Module 8: Data Quality

- **Define data quality** while clarifying on related terms (e.g., uncertainty, accuracy, precision or resolution, and up-to-datedness)
- Describe **data quality components** adopted in US **metadata** standard – lineage, positional accuracy, attribute accuracy, logical consistency, and completeness
- Create metadata (Lab10)
- Describe measures of data quality – **RMSE** and **error matrix**
- **Assess data quality** (i.e., determine the fitness of use of data) for a given problem (P3)

Veregin. 2005. *Geographical Information Systems: Principles, Techniques, Management and Applications*. Wiley: 177-189

Module 9: Data Classification Method

- **Why** should we **care** about **data classification methods**?
- Describe **how** each of data classification methods – **equal interval, quantile, standard deviation, and natural break** - **works**
- Discuss **strengths and weaknesses** of each of data classification methods
- Make thematic maps based on different data classification methods (Lab11)

Slocum et al. 2008. *Thematic Cartography and Geographic Visualization*. Prentice Hall: 57-75

Module 10: Data Acquisition Strategy

- Describe the difference between data **discovery** service (e.g., Geospatial One-Stop) and data **access** service (e.g., The National Map Viewer)
- Describe characteristics of **data products** mentioned in Bolstad reading
- Describe how **geographic units of U.S. Census** are organized
- Recognize different geographic **data formats** (e.g., shp, dgn, MrSID, dbf, img, e00) in relation to data model/type (e.g., vector, raster, attribute data)
- Identify **sources of data** suitable for problems defined in your GIS project (P3)

Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 243-246
Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 279-284
Bolstad. 2008. *GIS Fundamentals*. Eider Press: 259-289
U.S. Census. 2008. http://www.census.gov/geo/www/geoareas/GTC_08.pdf

Module 11: Vector Spatial Analysis

- Describe, discuss when to use, execute, and recognize issues involved in using each of the following methods of spatial analysis applied to vector data: **query, buffering**, and **overlay** (Lab3; Lab12)
- Identify problems involved in **polygon overlay**, and discuss options for getting around those problems (e.g., fuzzy tolerance, point-in-polygon)
- Distinguish between table join and **spatial join**, and understand how spatial join is operated in GIS software (Lab12)

Bolstad. 2008. *GIS Fundamentals*. Eider Press: 342-361
Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 360-363, 366-368

Module 12: Raster Spatial Analysis

- Describe, discuss when to use, execute, and recognize issues involved in using each of the following methods of spatial analysis applied to raster data: **inverse distance weighting, kernel density estimation, reclassification, and overlay** (Lab13)
- Compare and contrast **vector and raster overlay**
- Describe the difference in rules for combining multiple criteria (that is **dominance** rules vs. **contributory** rules) after overlay in the application of suitability analysis – examples in the reading are exclusionary screening vs. linear combination (Lab13)

Bolstad. 2008. *GIS Fundamentals*. Eider Press: 342-361
Longley et al. 2010. *Geographic Information Systems & Science*. Wiley: 371-373, 375-376
Chrisman. 2001. Exploring Geographic Information Systems. Wiley: 132-133, 137-141, 143-146

Module 13: Spatial Data Infrastructure

- Describe each of the following **components** of spatial data infrastructure (SDI), and discuss why each component is necessary (i.e., what is benefit?) and is related to other components: **data, metadata, standards, services, and partnership**
- What is the **tenet of SDI**? Or why should we care about SDI?

Rajabifard, Feeney, and Williamson. 2004. *Developing Spatial Infrastructures: From Concept to Reality*. CRC Press: 17-28
SDI Cookbook: http://www.gsdidocs.org/GSDIWiki/index.php/Main_Page

10. Miscellaneous

Academic Honesty and Plagiarism: Academic honesty and integrity are expected at all times. Academic dishonesty, such as cheating or copying during exams, will be punished severely. Plagiarism – using someone else's work without acknowledgment and, therefore, presenting their ideas or quotations as your own work – is strictly forbidden. DePaul University officials will be informed of any instance of academic dishonesty and notification will be placed in your file. Please read the DePaul Academic Integrity Resources page (http://academicintegrity.depaul.edu/Resources/index.html) for definitions and explanations of plagiarism and the University's Academic Integrity expectations for students. Cutting and pasting text taken directly from a web-site without appropriate referencing and quotation marks is plagiarism and is forbidden. Submitting work that has any part cut and pasted directly from the internet is grounds for an automatic grade of zero.

Accommodations: Any student who requires assistance is asked to contact the University's Office of Students with Disabilities (Phone 773/325-1677, TTY 773/325-7296, Fax 773/325-7396, website http://studentaffairs.depaul.edu/studentswithdisabilities.They will be able to assist both student and faculty. If you have a condition that requires accommodation from the Productive Learning Strategies program (PLuS Program) please contact them at the Student Center room 370 (Phone 773/3251677 or online: http://studentaffairs.depaul.edu/plus/

University Center for Writing-Based Learning: Collaborates with writers from all disciplines, backgrounds, levels of expertise, and roles within the University community. Their goal is to help develop better writers along with better writing and reflection through continual revision. If you need assistance with writing assignments, they can be contacted at: 773.325.4272 (LPC) or wcenter@depaul.edu

11. Frequently Asked Questions

A. Where and when can I use GIS software on campus?

Name	Location	Hour	# Computers
GIS Lab	SAC 224	Check the door	27
QRC Lab	SAC 268	See QRC website	27
GEO Lab	990 W Fullerton, Rm# 4515	9-5	3
Richardson Lab*	2350 N Kenmore	See Library website	?

*Effective as of Winter Quarter of AC 1011, ArcGIS 10 is available in Richardson Library's computer lab. Be advised that library staff is not trained in GIS, and is not expected to trouble-shoot any problems specific to GIS. Email instructors if that happens.

B. Is there any way that I can have ArcGIS 10 installed in my personal computer?

Yes. Order 60-day evaluation copy at
www.esri.com/software/arcgis/arcview/eval/evalcd.html

C. I lost my USB drive. What should I do?

It's most likely that your flash drive is at QRC (SAC268) unless somebody took it. Contact a QRC (Quantitative Reasoning Center) lab manager, Jennifer Galka by phone (773) 325-4663 or by e-mail JGALKA1@depaul.edu.

To help her identify who a lost flash drive belongs to, I suggest that you put a text file called "Open if Lost" in the main directory of your flash drive. In the text, you can put your name and an e-mail address so that you can be contacted in case the flash drive is found.

D. Is there any existing base map or data layers from which I can build maps or databases of my own?

Yes. Check out the folder C:\StreetMap05 in GIS Lab and GEO Lab.

Appendix A: Potential Community GIS Projects in Winter Quarter AY1011

I. Puerto Rican Cultural Center (PRCC) in Humboldt Park

1. **Food desert**: As part of Community Organizing for Obesity Prevention (CO-OP), PRCC has collaborated with DePaul University in understanding the access to food (more specifically fresh produce). Over the last several quarters, GEO242 students have mapped the location of food venues (e.g., restaurant, grocery store) with relevant characteristics (e.g., nutrition, price). If this project is chosen, this group is likely to collect/verify additional or existing food merchant data, map census data (if interested in looking at socioeconomic variables for characterizing food access), and conduct spatial analysis for delineating food desert. Results of this will serve as a baseline database for ongoing Block-by-Block health knowledge survey funded by NIH. That is, the association of food access with health records can be determined by linking food access to health survey data. Click here for the previous project report.

2. **Cultural heritage tour**: PRCC explores the idea of using GIS for developing cultural heritage tour to promote the preservation of arts and culture. GIS can be used to inventory cultural heritage sites first, and to develop cultural heritage routes. Another component of this project is potentially to provide technology education (such as GPS data collection) to teenagers in this community. The expected outcomes include multimedia cultural heritage database, and the map of cultural heritage tour. If chosen, this group is expected to collect/map relevant cultural sites data, and design tours based on clients' criteria.

PRCC Contact:
   Alejandro Luis Molina
   Secretary, Board of Directors of Puerto Rican Cultural Center
   Office phone: 773-342-7989 or 773-278-6738 (Vida Sida)
   Email: amolina@prcc-chgo.org
   2703 W Division St Chicago IL 60622
   URL: http://prcc-chgo.org/

II. Enlace Chicago in Little Village

3. **Alternative transportation**: Enlace Chicago promotes alternative modes of transportation (e.g., bicycling, walking) to mitigate traffic congestion (which is prevalent in Little Village) and promote healthy behavior. Last quarter, GEO242 students collected bike traffic and bike facilities (e.g., lane, route, rack) along the major street. This data collection efforts need to be expanded. This study will aid in gathering baseline information regarding demand and supply of bicycling (and walking if desired). If chosen, this group is likely to collect and map bicycling traffic and facilities data beyond 26th street. Results of this study can be instrumental in securing fund for bicycling facilities by City of Chicago. Click here for the previous project report.

4. **Food assistance**: Emergency food providers (e.g., food pantry) are in high demand during recession. Emergency food providers work together with community organizations (mostly faith-based organizations) in arranging the supply and distribution of emergency food. Coordination among those involved in providing

emergency food, including sharing information such as the availability of food and locations/characteristics of related sites are the key to smooth and successful operations. Enlace Chicago is interested in building the online site (e.g., Google Map) for sharing data regarding food assistance. If chosen, this group is expected to collect/map relevant sites, and create the online site for sharing information regarding emergency food provision.

5. **Community tour**: Enlace Chicago has gathered information about community tour sites over time (originally developed for Illinois State University students interested in becoming teachers in this neighborhood as part of Chicago teacher pipeline program). Now they consider using this data for developing digital media of community tours that can be tailored to different audiences using GIS. If chosen, this group is likely to geocode community tour sites, and develop community tours based on clients' criteria using spatial analysis tools.

Enlace Chicago Contact:
    Alexander Simone
    Cell phone: 773-703-9272
    Email:salexander@enlacechicago.org
    2756 South Harding Ave, Chicago IL 60623
    URC: http://www.enlacechicago.org/

III. Chicago Fair Trade

6. **Mapping Fair Trade organizations**: Chicago Fair Trade has set goals to become a fair trade city. (more on the national movement on fair trade towns at www.fairtradetownsusa.org). Two goals have geographic requirements: (1) one fair trade outlet (cafe or store that sells fair trade) in each of Chicago's 77 community areas; (2) one fair trade institutions serving fair trade: congregation, school, university, hospital, workplace in each of Chicago's 77 community areas. Chicago Fair Trade currently has data in an excel file with name and address to begin this mapping. Chicago Fair Trade would like a map that could be incorporated into its website so constituents could see which areas need more action. Ideally the map could list the names and addresses of institutions in each community area. If chosen, you will geocode data, and create maps amenable to internet. Click here for the previous project report.

Chicago Fair Trade Contact:
    Nancy Jones
    Office phone: 312-212-1760
    Email: njones@chicagofairtrade.org
    637 S. Dearborn St, Chicago IL 60605
    URL: http://www.chicagofairtrade.org/

Steans Center Contact:
    Howard Rosing
    Office phone: 773-325-7457
    Email: HROSING@depaul.edu
    2233 N. Kenmore Ave, Chicago IL 60614
    URL: http://steans.depaul.edu/

Appendix B: Department of Geography Learning Goals

Learning goals relevant to GEO242 are highlighted below.

Courses in the Department of Geography teach students:

1. **Understand spatial patterns and processes of modification of the Earth's physical and cultural landscapes**
   (a) As social constructions.
   (b) As systems that link the Earth with human society in interdependent, dialectical relationships, and
   (c) **Through mapping and visualization**.

2. Understand the concept of scale as a spatial phenomenon that ties the local, the regional, the national, the transnational, and the global in a system of interaction.

3. Understand the phenomenology of the discipline of Geography—most importantly, "space", "place", "landscape," "region," and "location".

4. Distinguish that spaces, places, and so on, may have both objective and subjective/symbolic dimensions.

5. **Develop research and writing competences that would allow you to:**
   (a) Formulate a cogent research question about the spatial character of a physical, socio-cultural, or environment-societal phenomenon,
   (b) **Write about it in ways that reflect analytical and critical thinking**, and
   (c) **Ethical concern over social and environmental justice, consistent with the University's social mission.**

6. **Engage competently in** qualitative and **quantitative spatial analysis**, and with exercises that are concerned with explaining spatial regularities (for example, the spatial calculus behind the location of retail commerce in Chicago, or transnational flows of capital).

7. **Learn the basic utility and use competently one or more of the information technologies that are now redefining the logistical limits of spatial analysis: geographic information systems (GIS) and remote sensing.**

8. Achieve greater general knowledge of the world, its regions, its physical systems, its cultures, and political-territorial divisions.

Appendix C: Harvard Referencing Style

Reference Lists:

Reference lists must be in alphabetical order by author's last name. Items by the same author must be in chronological order. Indent all but the first line of the citation. Please use the following style:

> *When referencing a direct quotation:*
> Knox and Pinch (2000: p.172) argue that "social polarization has been taking place."
>
> *When referencing an idea:*
> According to Knox and Pinch (2000), there has been social polarization.

Books:

Knox, Paul and Steven Pinch. 2000. *Urban Social Geography: An Introduction.*4thed. Englewood Cliffs, NJ: Prentice Hall.

Book chapters in an edited collection:

Beauregard, Robert A. 1986. The Chaos and Complexity of Gentrification. In Smith, Neil and Peter Williams, eds. *Gentrification in the City.* Boston: Allen and Unwin: 35-45.

Journal articles:

Borchert, John R. 1967. American Metropolitan Evolution. *The Geographical Review* 57(3): 301-332.

Internet articles:

Gray, Geoffrey. 2003. Bad for Business: Budget Cuts Threaten Small Manufacturers. *City Limits Weekly* #411. www.citylimits.org. Accessed May 5, 2008.

GEO242: GIS II
Stage0: Project Proposal (P0)

First, identify:

- 4-5 group members who are interested in working on similar topics
- A project sponsor (client) – selected from Appendix A. If it is the project proposed by group members, it will be the name of those students or organizations that those work for.

Second, respond to each prompt with a brief (i.e., less than 100 words), well-thought-out answer through group discussion. This can be gathered from the meeting with clients on the first day of the class as well as project description given in syllabus. The prompts listed below are meant to help you plan your project. Remember that the proposal is just a plan. You will almost certainly change part of your plan and you may even change all of it, before you complete your project.

- Your proposed work (topic area):
- Major question(s) you hope to answer or goal(s) you hope to achieve:
- Project results (what will be the measurable outcomes of your project?):
- The qualification (knowledge, skills, abilities, experience) of each project member:
- Your biggest concern(s) or question(s) about the project:

Finally, type in answers to each prompt listed above using a word processor, and turn in a hardcopy by January 11[th,] 2011. If the extension of a deadline is necessary, please let an instructor know in advance.