GEO 242 (Geographic Information Systems II: Community GIS)

Autumn Quarter 2018 | Department of Geography | DePaul University

We meet on Tue/Thurs 4:20-5:50 pm at SAC 224 (SAC GIS Lab)

1. Course Description: An intermediate-level course focusing on applications of GIS for community development. Students conduct real-world GIS projects for community organizations in Chicagoland. Students will learn to design and create geographic information products that meet community partners' needs through the process of proposing, defining, and implementing GIS projects in collaboration with community partners. The course focuses on data acquisition/collection and spatial analysis, including geocoding, GPS data collection, spatial join, proximity analysis, and density mapping. Instruction is accomplished through lectures and hands-on exercises using ArcGIS. Contents are aligned with Geospatial Technology Competency Model. GEO 141 or PSC 201 is a prerequisite for this class.

2. Instructors' Contact and Office/Lab hours

	Instructor	Teaching Assistant	GIS Coordinator
Name	Sungsoon (Julie) Hwang	TBA	Cassie Follett
Contact	shwang9@depaul.edu (773) 325-8668	TBA	CFOLLETT@depaul.edu (773) 325-3267
Where	990 W Fullerton, 3133	TBA	990 W Fullerton, 3134
When	T/TH 2-3 pm or by appointment	TBA	when technical issues arise in GEO GIS Lab

3. Learning Goals/Topics

- Discern the interplay between **GIS and organizations** by observing how information needs arise in organizational contexts, and helping community organizations to meet their needs using GIS
- Become proficient at **map design** that serve to fulfill information needs of community partners
- Grasp the diverse processes of GIS **data collection** including attribute data import, geocoding, field GPS data collection, and digitizing by developing GIS databases
- Understand elements related to **data quality**, including accuracy, completeness, and currency
- Comprehend how methods of **spatial analysis**—including overlay, proximity analysis, density mapping, spatial interpolation, and map algebra—work, and when to use them

4. Learning outcomes— After completing requirements of GEO 242, you should be able to

- Assess geographic information needs given organizational contexts
- Articulate implications involving choice of cartographic parameters applied to map design such as data representation, color use, type use, visual variables, and map types
- Create ArcGIS Geodatabases by executing various data collection techniques, including data import, geocoding, heads-up digitizing, and GPS data collection
- Assess the fitness for use of data with respect to components of spatial data quality
- Conduct spatial analyses appropriate for a given problem
- Design and craft information products (maps and databases) based on needs assessment

5. Readings: There is no required text to buy. Readings will be provided on D2L as needed.

6. Course Outlines and Tentative Schedules*

Wk	Date	Topic	In-class activities	Tasks done in & out of class
1	09.06	Course overview	Community partners (CP) talk about their org. and projects	P1. Form a group and arrange to meet with CP
	09.11	GIS I recap: cartography, database, coordinate systems	Ex0. race and income in Chicago?	P1. Needs assessment meeting with CP
2	09.13	Data classification and normalization for thematic mapping, color/type use	Ex1. map population change	P1. Needs assessment meeting with CP
	09.18	Codd's normalization, geocoding, census, geodatabase	Ex2. create a geodatabase from street addresses and census data	P1. Conduct background research
3	09.20	Typology of GIS data collection, digitizing, coordinate transformation	Ex3. create a geodatabase by OSM data import (QGIS) and editing	P1. Conduct background research
	09.25		*Work on P1 as a group*	**HW1 due** (4:20p)
4	09.27	GPS, data quality	Ex4. GPS field data collection	**P1 due** (4:20p)
	10.02		CP visit to provide input for P1 and P2	P1. Seek feedback P2. List data needs
5	10.04	CITI Certification Training (no class)		
	10.09	CITI Certification Training (no class)		**CITI Cert. due** (11:59p)
6	10.11	Proximity analysis, overlay, spatial join	Ex5. Near, spatial join, Thiessen polygon, centroid tools	**HW2 due** (4:20p) P2. Acquire/create data
	10.16	Density mapping, spatial interpolation, map algebra	Ex6. Kernel density, IDW, raster calculator, zonal statistics tools	P2. Acquire/create data
7	10.18	Web mapping	Ex7. create a web map app	P2. Process/clean data
	10.23		*Work on P2 as a group*	P2. Assess data quality
8	10.25		*Work on P2 as a group*	**HW3 due** (4:20p)
	10.30		*Work on P3 as a group*	**P2 due** (4:20p) P3. Identify GIS functions.
9	11.01		*Work on P3 as a group*	P3. Create and present info. product for feedback
	11.06		*Work on P4, P5 as a group*	**P3 due** (4:20p)
10	11.08		*Work on P4, P5 as a group*	
	11.13	**Presentation (P4)**	CP visit for group presentation	**P4, P5 due** (4:20p)
11	11.15	**Final exam** (take-home) due 11:59p		

Project milestones

P1. Needs assessment: state context, motivation, and goals of the project in conjunction with your CP
P2. Data acquisition: describe what data you acquired and how you created data needed for project
P3. Data analysis & visualization: describe how you created information products (maps and database)
P4. Presentation – present goals, data, methods, results, and conclusions in front of your CP
P5. Final report and information products (IP) – submit final report and IP (e.g., map package files)

*Topics and schedules are subject to change depending on how the class progresses

7. Grading Scheme

Components	Breakdown (/100 points)	Additional information	Effort type
Participation	10	Based on attendance, class participation, and group discussion	Individual effort
Exercises	21	7 exercises. Each is worth 3 points	Group effort
CITI Certification	6	due in Week 5B 11:59 pm	Individual effort
Homework	12	3 homework. Each is worth 4 points	Individual effort
Project	36	P1-P4 4 points, P5 20 points	Group effort
Final exam	15	Take-home exam during an exam week	Individual effort

Participation: assigned according to the criteria below

- 9-10 = Student is present in all or nearly class meetings, and prepared, at all times, to respond to questions. Student is an active participant in small group activities, in and out of class, and in class-time activities stays on task.
- 8-9 = Student participates as above, 75% of the time.
- 6-7 = Student does not volunteer comments; responses demonstrate vague familiarity with course readings. Student is a passive member of small group activities and/or does not stay on task during class-time activities.
- 5-6 = Student never volunteers, cannot respond to direct questions, keeps silent during class discussions and is unable to summarize readings if asked.
- 0-5 = Student misses many class sessions and/or sits silently in classes when present, or is disruptive and non-participatory in the classroom.

Group Exercises: learn how to use ArcGIS, and submit answers to questions while performing GIS tasks. You can work on performing GIS tasks alone, but answers to questions should be submitted as a group work after discussion. Exercises will be completed in class when instructors are present under most circumstances.

Although reasonable amount of time is given to complete exercises in the class, it is expected that you as a group will complete remaining part of activities outside of the class if you can't complete activities in the class while most of other groups completed activities in time. Exercises can be submitted on the date exercises are handed out or before the next class. Exercise questions will be discussed together in the next class.

Homework: solve problems that are similar to group exercises on your own. HW1 (geodatabase) is drawn from Ex1 and Ex2. HW2 (data capture) is drawn from Ex3 and Ex4. HW3 (spatial analysis) is drawn from Ex 5 and Ex6. Homework should be submitted on D2L individually.

Project: A group of three persons will work together throughout the quarter in and outside of the classroom to achieve goals that groups set out in conjunction with community partners. Project consists of five milestones: P1 (needs assessment), P2 (data acquisition), P3 (data analysis and visualization), P4 (presentation), and P5 (final report).

Although a few hours will be set aside for each milestone in the class (see the class schedule above), it is expected that you will spend 4-6 hours a week for project outside of the class on completing project milestones in coordination with your group members and community partner throughout the quarter.

For instance, you would need to spend several hours to do the following outside of the class:

- Conduct needs assessment meeting with your CP during week 1-2 for P1
- Conduct background research during week 2-3 for P1
- Identify data requirements and seek feedback from community partner during week 4 for P2
- Acquire or create data in coordination with your CP during week 6 for P2
- Clean up data and explore data for assessing data quality during week 7 for P2
- Create information products (maps and databases) during Week 8 - 9 for P3
- Prepare presentation and write up final report during week 9 - 10 for P4 and P5

Final exam: an open-book comprehensive written test will be taken during an exam week. You will receive a test via email on the date scheduled for a final exam at 9 am, and should submit answers to questions on D2L by 11:59 PM on that date.

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

Late Work Policy: Late work will NOT be accepted. Extensions can be requested if needed, but will be only granted under understandable circumstances (e.g., clients did not provide data in time; you had to be in a funeral).

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.

8. Access to ArcGIS

Labs with ArcGIS for Desktop: SAC GIS lab (SAC 224), SAC 268, 990 GIS lab (990 W Fullerton, Room# 3135), Richardson Library, Loop Library, Daley 1327

GIS lab open hours

- Geography GIS Lab (990 W Fullerton, Room# 3135): https://las.depaul.edu/academics/geography/geographic-information-systems-certificate/Pages/gis-lab.aspx or the lab door.
- SAC GIS lab (SAC 224): http://qrc.depaul.edu/hours.htm or the lab door.

Install ArcGIS in your Windows personal computer: ArcGIS is ONLY supported in Windows computer. If you're enrolled in GIS classes at DePaul University with an ESRI site license, you will receive a digital student license via email. If you have an Apple computer, use DePaul Virtual Lab.

To access ArcGIS in both PC and Mac remotely: go to DePaul Virtual Lab http://vlab.depaul.edu. Quality of user experiences vary by internet speed. At least 8 Mbps is recommended. If you have an issue with using Virtual Lab, contact a GIS coordinator.

9. Miscellaneous

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.

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 Center for Students with Disabilities (CSD) (Phone 773/325-1677, TTY 773/325-7296, Fax 773/325-7396, 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

Harvard Referencing Style
(a) 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.
(b) Books: Knox, Paul and Steven Pinch. 2000. Urban Social Geography: An Introduction.4thed. Englewood Cliffs, NJ: Prentice Hall.
(c) 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.
(d) Journal articles: Borchert, John R. 1967. American Metropolitan Evolution. The Geographical Review 57(3): 301-332.
(e) Internet articles: Gray, Geoffrey. 2003. Bad for Business: Budget Cuts Threaten Small Manufacturers. City Limits Weekly #411. www.citylimits.org. Accessed May 5, 2008.

10. Department of Geography Learning Goals—GEO 242 addresses 1), 5), 6), and 7).

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 A: Community Partners and Project Description

The Coalition for Immigrant Mental Health (CIMH)		
CBO Mission Statement		
The CIMH mission aims to foster a collaborative, community-based and research-informed initiative that is a partnership between individuals regardless of status, mental health practitioners, community organizers, researchers, and allies. As such, CIMH works to promote awareness of and access to culturally and linguistically appropriate mental health services through education, advocacy and resource sharing in order to improve and facilitate access to services for immigrants and their families regardless of their status.		
CBO Website		
www.Cimhil.org		
CBO Contact Information		
Primary Contact Name:	**Primary Contact Email:**	**Primary Contact Phone:**
Maria Ferrera	mferrera@depaul.edu	312.362.7382 Cell: 773.879.0057
Secondary Contact Name:	**Secondary Contact Email:**	**Secondary Contact Phone:**
Virginia Quinonez	vquinonez@thechicagoschool.edu	312.329.6623
Project Details		
Identified as one of its action areas, The Coalition works to promote awareness of and access to culturally and linguistically appropriate mental health services through education, advocacy and resource sharing in order to improve and facilitate access to services for immigrants and refugees. As part of its efforts, CIMH has developed a directory of mental health services available to immigrants, community organizations and practitioners across the metropolitan area. We continue to expand this directory to include community- based organizations throughout Illinois and neighboring cities/states. It would be helpful if we can provide a visual map to these locations that provide mental health services. The directory can be found here: **https://cimhil.org/resources/mh-directory/**. In addition to the mapping of these locales, it would be helpful to understand the map in the context of where most immigrants/undocumented immigrants live and get a sense of geographic areas where mental health services seem to be lacking. CIMH core leadership team can further discuss other areas of information that would be helpful with regard to a GIS mapping project.		

Community-based Organization (CBO) Name		
Community Activism Law Alliance (CALA)		
CBO Mission Statement		
CALA unites lawyers and activists in a collaborative pursuit for justice by leveraging legal services to benefit the most marginalized communities and individuals. CALA is changing legal aid. We are changing how lawyers and communities work together. Our lawyers work with activists to help their communities access justice and pursue social change**.**		
CBO Website		
http://www.calachicago.org/		
CBO Contact Information		
Primary Contact Name:	**Primary Contact Email:**	**Primary Contact Phone:**
Saul Brand Padilla	saul@calachicago.org	312-999-0056
Secondary Contact Name:	**Secondary Contact Email:**	**Secondary Contact Phone:**
Alejandra Flores	alejandra@calachicago.org	NA

Project Details
CALA has a unique lawyering model; therefore, we started some research to find out if there are other Legal Aid organizations around the nation that have the same or similar model to us. Our goal is to create an interactive map (GIS) to be used as a tool for community members/activist all around the US to help them locate Legal Aid organizations near them. CALA has the initial data for this project: Name of the organization ranked by accuracy in our model, state, and the email draft that can be used to reach out to those organizations.

Community-based Organization (CBO) Name		
Dream On Education		
CBO Mission Statement		
Our mission is to prepare high-performing, low-income 6th-8th grade students for the rigor of a high school and college curriculum and challenge them beyond their comfort level, which will enable them to maximize their potential, reach their dreams, and contribute positively to society.		
CBO Website		
www.dreamoneducation.org		
CBO Contact Information		
Primary Contact Name:	**Primary Contact Email:**	**Primary Contact Phone:**
Kelli Haywood	Kelli.Haywood@dreamoneducation.org	816-729-6880
Secondary Contact Name:	**Secondary Contact Email:**	**Secondary Contact Phone:**
Tom Perros	Tom.Perros@espglobal.com	

Project Details
Dream On Education provides services to high-achieving low-income students in the Greater Chicago Area. This demographic is often the "forgotten group" that falls through the cracks. We want to gain a clearer, more in-depth picture of this demographic in the Greater Chicago Area. We're looking to determine the number of students that fall in this category (high-achieving, low-income 6^{th}-8^{th} graders), the gender breakdown, the racial breakdown, the neighborhood make-up, and median household income. Our goal is to be able to show our current and potential supporters that this is a largely underserved population. The statistics are available on a national level. However, we want to drill that down to Chicago. Here's a link that would be helpful in analyzing this demographic (High Achieving Low-Income 6^{th} – 8^{th} Graders in the Greater Chicago Area) https://cps.edu/SchoolData/Pages/SchoolData.aspx (the School Level NWEA Growth and Attainment has great data. The other links do, too, but that may be a great starting point.)