

# Urban Applications of Geographic Information Systems (GIS) POLI 310 and PUBA 502

May Evening 2013  
Tuesdays and Thursdays, 5:30 to 8:45 p.m.  
Bell South Building, Room 219

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## Course Description

This course provides an overview of geographic information systems applied to the study of cities and urban policy issues. It introduces students to foundational concepts and applications of Geographic Information Systems (GIS), and it asks students to use this software to explore and solve real-world urban problems. Students will learn about the data and methodology for using GIS to solve urban problems in economic, social, planning, and political settings. Topics covered include an overview of GIS data, the spatial display of data, conducting queries on data, and geocoding among many others. The main software used for the course is ArcGIS 10.1, which is produced by the Environmental Systems Research Institute (ESRI). This course is conceptualized as one that bridges theoretical ideas with an applied skill. This means that your course readings are extremely important, as you will read about an urban theory and possible ways to study the applicability of this theory to an issue occurring in the world. **We will then work directly with the software for most of the class session to study that issue.**

## Objectives

Students successfully completing Urban Applications of Geographic Information Systems will be able to *define* several foundational concepts in urban studies and applications of the ArcGIS software to explore these concepts. Students will be able to *apply* the ArcGIS 10 software to explore real world urban problems. Students will also be able to *critique* the GIS as both a practice and a software system.

## Course Philosophy and the Culture of GIS

This course is both theoretical and applied, and it is offered at the advanced undergraduate level and at the graduate level. As such, there are two expectations from

students. First, it is expected that the bulk of student learning is going to come from independent work. Students are required to work independently to understand complex theoretical and conceptual ideas; class time will be used to clarify some of these ideas, but most time will be spent working directly with the software and concepts. This means that reading the course text before you come to class is required to fully achieve learning in this class. Second, learning of an applied skill is achieved by actually working with that skill directly. Again, this means that most of the class time will be used to work with the data and software. *If you do not read the textbook, you will not be successful in this class and your learning will be quite limited.*

Further, geographic information system work is typically conducted via team work, and that process will be mirrored in this class. That means that you are expected to share insights with your classmates regarding how to complete GIS tasks in the labs, and you are encouraged to ask each other if you have questions as you work independently. It is imperative that you realize that the content of this course is different from other courses, and so it necessitates a different mode of delivery. We will start lab assignments in class while I'm here to help make sure you begin correctly, but you will be expected to finish the labs on your own time in addition to reading the textbook. (This is part of the course structure. It is intentional.) It is expected that you will be in the lab during non-class hours, and that you will be talking with and learning from each other. Experiencing such a learning environment is part of the process of learning GIS and digital culture.

Please keep an open mind! You will be working with software that is onerous, frustrating, and sophisticated while also being practical, powerful, and easy to use at the same time. Please be aware that you will get frustrated; I will too. However, just take a deep breath and know that this is part of the process and is to be expected.

Finally, this is a course that includes both graduate and undergraduate students. To justify advanced credit, the graduate students must demonstrate an advanced engagement with geographic information systems and the course content. This means that the graduate students in the class will be responsible for leading the class in a critique of geographic information systems.

## Course Texts

There is one required textbook for this course; it is available for purchase at the campus bookstore. The main readings for the course will come from this book, as will the labs and data. It is essential that you purchase this book.

The cost of a new copy of this book is \$156.15, a used copy is \$117.10, and a rental copy is \$76.40. You can also rent an ebook for \$68.90 or buy an ebook for \$103.35. The bookstore has each type of copy.

Greene, Richard and James B. Pick. 2013. *Exploring the Urban Community: A GIS Approach, 2<sup>nd</sup> Edition*. Upper Saddle River, NJ: Pearson Prentice Hall. ISBN: 978-0-321-75159-1.

DO NOT purchase an earlier edition of this textbook. The data will not correspond to the data that we will be using, and the earlier versions are based on earlier versions of the software. We will be using ArcGIS 10.1.

IMPORTANT: Check to make sure the book you are purchasing has either a data CD in the back or provides you with a code and a web site where you might download the data.

There will also be several articles posted on OAKS that all students are required to read.

You will also need to bring a flash drive to each class period for storing data and your work.

### Assignments & Evaluation

*There are different percentage allocations for the undergraduate and graduate students because the graduate students have an additional assignment.*

**Class participation** – The class participation grade will be determined by your attendance at each class, your engagement during the lectures and small group discussions, and your responses to questions and to other students' comments. Sleeping or putting your head down during the course will adversely affect the grade. Lateness—both at the beginning of the course and after the break—as well as early departures, will adversely affect the grade. Chatting online using the class computers or other electronic device, or text messaging during class will also negatively affect your grade. The participation grade will be determined primarily by your willingness to speak up and share thoughts, questions, and concerns during the course.

For undergraduate students, participation counts as **15% of your grade**.  
For graduate students, participation counts as **15% of your grade**.

Please see Rubric #1 “Evaluating Student Participation,” which is posted on OAKS, for more detailed information regarding how I will evaluate your participation.

**Lab Exercises and Assignments** – The bulk of your learning in this class will come from lab exercises found at the end of each chapter and those assigned by me that will ask you to think creatively about urban problems and to use GIS to solve those problems. During the first half of the semester, we will work primarily from the textbook. For the second half of the semester, the labs will require you to think creatively about using GIS to solve some real world problem. You are required to do all labs. You will be evaluated on organization, grammar, spelling, and presentation in addition to correct content.

For undergraduate students, lab exercises count as **45% of your grade**.  
For graduate students, participation counts as **45% of your grade**.

**Midterm** – There is a midterm exam in this class, which will be given on Thursday, 30 May during the second half of our scheduled class time. The midterm exam will be a mixture of multiple choice, short answer, and essay questions that cover both theory, application of theory, and use of the software.

For undergraduate students, the Midterm counts as **20% of your grade**.  
For graduate students, the midterm counts as **10% of your grade**.

**Final Exam** – There is a final exam in this class, which will be given on the last day of class (20 June) during our regularly scheduled class time. The final exam will be a mixture of multiple choice, short answer, and essay questions, as well as calculations using the ArcGIS software.

For undergraduate students, the final exam counts as **20% of your grade**.  
For graduate students, the final exam counts as **10% of your grade**.

**Graduate student presentation** – This assignment is for graduate students only. Graduate students are required to sign up to lead a presentation on one article that critically explores GIS. There is a detailed rubric that explains how you will be graded on this assignment available on OAKS. The presentation will be worth **20% of your grade**.

Please see Rubric #2 “Evaluating Graduate Student Presentations,” which is posted on OAKS, for more detailed information regarding how I will evaluate your presentation.

**Your final grade for the course will be calculated using the following grade distribution (percentage of total score of all assignments).**

A = 93 – 100	B = 82.5 – 87.4	C = 72.5 – 77.4	D = 62.5 – 67.4
A- = 90 – 92.9	B- = 80 – 82.4	C- = 70 – 72.4	D- = 60 – 62.4
B+ = 87.5 – 89.9	C+ = 77.5 – 79.9	D+ = 67.5 – 69.9	F = 0.0 – 59.9

## General Policies and Procedures

- **Statement on Academic Integrity:** The College of Charleston regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the Student Honor Code and the Code of Conduct. The College will pursue cases of academic dishonesty.

Complete information about the College of Charleston's academic integrity policies is available through the Office of Student Services. Please see the following document, available online:

[http://studentaffairs.cofc.edu/general\\_info/honor\\_system/index.html](http://studentaffairs.cofc.edu/general_info/honor_system/index.html) .

- **Student Email:** Students are required to have a College of Charleston email account and to check it at least once per day. All notices regarding the course will be sent to the College of Charleston account.
- **Faculty Email:** The professor uses KeenanK@cofc.edu and will check it at least once per day during the week. Immediate responses via email should not be expected, but can generally be expected within a 24-hour period.
- **Cell phones and pagers** may be left on, but they must be turned to silent mode.
- **Texting in class** while lecture is in progress or while people are participating is rude. It also hinders your learning. Please do not do it.
- **Chatting online, or checking facebook** while lecture is in progress, while people are participating, or while you should be working on the lab is rude and distracting. It also hinders your learning. Please do not do it.
- **Appropriate use of computers is expected.** These computers have been purchased and made available to you for the purpose of studying geographic information systems and advancing your education. This means that you are not permitted to use these computers for non-academic purposes. It is your responsibility at all times to justify how your use of the computer is advancing your intellectual capabilities.
- **General lab etiquette:** We are the first people to be using this lab space. It is brand new, so any damage will be directly traceable to our class. Please do not bring beverages into the room that are in cups; please use only sealable bottles. Please discard any food that is brought into the lab in a hallway garbage can; do not discard

stuff in the room and then leave, especially if working here late in the evening, as it will not be cleaned until the next day (and this will, eventually, result in bugs visiting us).

- **Special needs or concerns:** Any students who have special learning needs or concerns are urged to speak with me during the first week of the semester if accommodations are needed. The Center for Disability Services provides a comprehensive list of accessibility resources available at the College on the following website: <http://spinner.cofc.edu/~cds> .
- **Mutual respect for differing questions and ideas:** The College is a place for open inquiry and exchange of ideas. All members of the College should treat all other members of the College and members of society with mutual respect and appreciation.

### Schedule

*All reading should be completed before the class period for the associated date.*

Class 1 (Tuesday 5/14): Introduction to ArcGIS

Reading: *The following readings are available on OAKS:*

- “What is GIS?”
- “Restaurants Optimize Site Locations”
- “Participatory GIS”
- “Mapping the Past”
- “Getting a Job in Geography and GIS”
- “Detroit Releases 50-Year Framework Plan”

Focus of lecture, discussion, and exercises

- Overview of GIS
- Ways that GIS is applied and used
- Define Shapefile
- Define Map Document
- Learn the user interface

Class 2 (Thursday 5/16): The Spatial Display of Urban Environments

Reading:

- Chapter 1~ lab is due at the start of the next class

Focus of lecture, discussion, and exercises

- Working with shapefiles
- Editing shapefiles

Class 3 (Tuesday 5/21): Defining the Metropolis

Reading:

- Chapter 2 ~ lab is due at the start of the next class
- Critical GIS article available on OAKS: “GIS as tool or science” by Wright et al.

Focus of lecture, discussion, and exercises

- Overview of data sources
- Working with the census
- Queries

Class 4 (Thursday 5/23): Presentation by Tracy McKee

Systems of Cities

Reading

- Chapter 4 ~ lab is due at the start of the next class

Focus of lecture, discussion, and exercises

- Performing calculations within ArcGIS
- Classifications

- Symbolizations

Class 5 (Tuesday 5/28): Neighborhoods

Reading:

- Chapter 5 ~ lab is due at the start of the next class
- Critical GIS article available on OAKS: “Feminist Visualization” by Kwan

Focus of lecture, discussion, and exercises

- Mapping neighborhood change
- Markov chains

Class 6 (Thursday 5/30): Migration and Residential Mobility

Reading:

- Chapter 6 ~ lab is due at the start of the next class

### **Mid-term exam**

Class 7 (Tuesday 6/4): Race, Ethnicity, Gender, and Poverty

Reading:

- Chapter 7 ~ lab is due at the start of the next class
- Critical GIS article available on OAKS: “Negotiating knowledge production: The everyday inclusions, exclusions, and contradictions of participatory GIS Research” by Elwood

Focus of lecture, discussion, and exercises

- Population potential and site locations
- Geocoding



Class 8 (Thursday 6/6): Industrial Location and Cities

Reading:

- Chapter 8
- Critical GIS article available on OAKS: “Mapping Environmental Injustices” by Maantay

Focus of lecture, discussion, and exercises

- Location quotient
- Joins and Relates

Class 9 (Tuesday 6/11): Urban Core and Edge City Contrasts

Reading:

- Chapter 9
- Critical GIS article available on OAKS: “Beyond Cooptation or Resistance” by Elwood

***Class 10 (Thursday 6/13): No class; Keenan at 9TAD conference.***

Class 11 (Tuesday 6/18): Environmental Problems

Reading:

- Chapter 10 ~ lab is due at the start of the next class
- Critical GIS article available on OAKS: “Social Power and GIS Technology” by Wright et al.

**Class 12 (Tuesday 6/20): Final Exam**