Instructor and Class Times and Location
Daniel R. Block, Ph.D.
Adjunct Assistant Professor, Public Health
Mondays, 6:30 – 9:30 PM
Galter Health Sciences Library LRC, 303 E. Chicago Ave
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Office Hours: By appointment

Course Description
Within the last twenty years, the development of Geographic Information Systems and Spatial Analysis techniques have sparked new ways of storing, analyzing, and depicting health information. GIS analysis and depictions of obesity, food access, and health inequities, for instance, have helped lead to a new awareness and understanding of these issues. GIS is also used in the maintenance and reporting of health information, emergency response preparation, and in many other health applications. This course is an introduction to using GIS and the collection, maintenance, and analysis of spatial data for health. It combines a workshop on learning ArcGIS, the industry standard GIS system, with study of the theory and applications of spatial data and spatial analysis in general and specifically as it relates to population health.

Canvas:
The syllabus and additional readings will be posted on the course’s Blackboard site, available at http://www.it.northwestern.edu/education/learning-management/login.html if you are registered for the course. You may use your NetID and Password to enter Canvas.

Objectives:
Upon completion of the course, students should be able to:
1) Identify the particular characteristics of spatial data that distinguish it from non-spatial data and techniques for constructing surveys and information systems that allow for the utilization of spatial data in a GIS and spatial analysis.
2) Identify sources of GIS-based health data and be able to import it into a GIS system.
3) Describe basic geographical data concepts, in particular projections and coordinate systems and be able to convert data sources utilizing different systems.
4) Perform basic data management, analysis, and cartographic functions within ArcGIS.
5) Describe specific uses of GIS and spatial analysis within the field of public health.
6) Design and complete a basic project utilizing GIS and/or spatial analysis techniques.

Readings:
There are two required texts for this class, plus additional readings:
3) Additional readings as indicated in the schedule below. These will be made available on the Canvas site. Further required and not required readings, including new studies utilizing GIS and spatial analysis may be made available over Canvas during the quarter itself.
**Computer Requirements:**
The Kurland and Gorr book comes with a 180 day trial version of ArcGIS 10.2. In addition to this, you may purchase a student copy of ArcGIS 10.2 for $100 after the trial period ends from ESRI. You need to load ArcGIS 10.2 on your laptop or desktop. ArcGIS is also available in the Galter Library LRC where the class will take place. In addition, the native platform for ArcGIS is Windows. If you have a Mac, you may run ArcGIS either with a virtualization program such as VMware Fusion or Parallels Desktop for Mac, or Boot Camp from Apple, in which you can run your computer in Windows or Mac. Boot Camp seems to work best, but you need to make a choice whether to run Windows or iOS while using the other options you can run both concurrently. You must also have a licensed copy of Windows XP or above loaded onto your computer. More information on running ArcGIS on Macs is available at http://edcommunity.esri.com/software-and-data/mac-os-support.

**GRADING:**
Grades are determined by a point system, as explained below. Assignments will be graded on the usual 90%=A, 80%=B, 70%=C, 60%=D system. The test MAY be curved.

**Points:** Points are earned through the following methods:
- Exam: June 3 100
- Final Project, Including Presentation 100
- 5 GIS Assignments, 20 Points Each 100
- 4 Written Assignments, 15 Points Each 60
- Class Participation and Attendance 40

**TOTAL** 400

**TUTORIALS AND ASSIGNMENTS:**
There are three different kinds of assignments in this class, plus tutorials.

**Tutorials:** The Kurland and Gorr book is a tutorial in GIS and Health. This tutorial is very thorough, but should be used as background for the assignments rather than as a replacement for them. I will go through what each tutorial talks about as we progress. If you do all the tutorials, you will receive a very broad overview of ArcGIS as well as its uses in public health. No points, however, will come from completing tutorials unless they are a specifically assigned part of a GIS assignment.

**GIS Assignments:** There will be five GIS assignments, each worth 20 points. These assignments cover specific issues and skills in GIS. They are designed to give you a good background for what GIS can do, as well as to teach you basic ideas of the nature of spatial data, cartography, and spatial analysis.

**Written Assignments:** There will be four written assignments, each worth 15 points. In the first and fourth of these you are asked to bring in and comment on a public health article using GIS. Another exercise asks you to collect a GIS dataset that will ideally be used for the final project. A final exercise asks you to turn in a proposal for your final project.

**Late Assignments:**
Late assignments are accepted, but will be penalized 10% of the total grade for that assignment for each day late. The midterm and final project will not be accepted late unless prior arrangements have been made. An assignment is late if it is turned in after 10PM on the date due.
ATTENDANCE AND PARTICIPATION:
Your participation grade (40 Points) is based half on attendance. In addition, you are also expected to participate in class in such a way that benefits their own learning and that of their classmates. Doing what is expected of you will merit a satisfactory evaluation; however, to receive an ‘A’ in participation, you must demonstrate a superior level of engagement in all aspects of the course.

Classroom participation is essential to the course. In terms of classroom participation I am looking for quality, not necessarily quantity. Some of the things I look for in terms of classroom participation:

• Posing of thoughtful questions relative to our topic(s) of interest
• Integration of readings/assignments into discussion
• Respect for others’ opinions/interests
• Extending ideas/skills covered to new situations
• Participation in in-class exercises

COURSE EVALUATION:
The MPH Program administers web-based course evaluations to students for each course near the end of the quarter. Your completion of both the unit (course) and faculty evaluation components is required; failure to complete either of the evaluations will result in an incomplete grade until the evaluations are submitted. You will be sent the web link and instructions via email later in the quarter. You will have about two weeks to complete the evaluations before grades are submitted.

ACADEMIC INTEGRITY:
Every Northwestern faculty member and student belongs to a community of scholars where academic integrity is a fundamental commitment. The Program in Public Health abides by the standards of academic conduct, procedures, and sanctions as set forth by The Graduate School at Northwestern University. Students and faculty are responsible for knowledge of the information provided by The Graduate School on their Web page at http://www.tgs.northwestern.edu/academics/academic-services/integrity/index.html

Academic misconduct includes, but is not limited to:

1. Receiving or giving unauthorized aid on examinations or homework
2. Plagiarism
3. Fabrication
4. Falsification or manipulation of academic records
5. Aiding or abetting any of the above

The PPH follows The Graduate School’s procedure for evaluating alleged academic misconduct, as outlined on the TGS website. http://www.tgs.northwestern.edu/academics/academic-services/integrity/dishonesty/index.html

Faculty reserve the right to use the “Safe Assignment: Plagiarism Detection Tool” that is part of the Course Management System to evaluate student assignments. Information about this tool can be found at http://www.it.northwestern.edu/education/course-management/support/assessments/safeassignment.html
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<th>Date</th>
<th>Topic and Readings</th>
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| Jan. 5     | Topic: Introduction to Health, GIS, and Spatial Analysis  
Readings: C&M: Intro, Ch.1, K&G: Ch. 1&2  
Assignments Due: none                                                                 |
Readings: C&M: Ch.2; K&G: Ch.3-4; USGS Projections Poster (on Blackboard)  
Assignments Due: Tutorials 1&2; GIS Assignment 1: Intro to ArcMap (20 Points) |
| Jan. 19    | **MARTIN LUTHER KING'S BIRTHDAY-NO CLASS**                                                                                                                                                                 |
| Jan. 26    | Topic: Spatial Databases for Public Health; Geocoding  
Readings: C&M: Ch.3; K&G: Ch. 5-6; Standard Geocoding Techniques (on Blackboard)  
Assignments Due: Tutorial 3; Written Assignment 1: Analysis of PH Study Utilizing GIS (15 pnts.) |
| Feb. 2     | Topic: Mapping Health Data: An Intro to Cartography and Spatial Data Visualization  
Readings: C&M: Ch. 4; K & G: 4;  
Assignments Due: Tutorial 4; GIS Assignment 2: Cartography (20 Points) |
| Feb. 9     | Topic: Data Transformations  
Readings: K&G: Chs. 7-8;  
Assignments Due: Tutorials 5-6; Written Assignment 2: Final Project Proposal (15 Points); GIS Assignment 3: Geocoding (20 Points) |
| Feb. 16    | Topic: Basic Spatial Analysis: Point Patterns and Clustering; Michimi and Wimberly article  
Readings: C&M: Ch. 5; K&G: Ch.9;  
Assignments Due: Tutorials 7-8; GIS Assignment 4: Data Transformations (20 Points)  
Written Ass. 3: Spatial Database Identification and Description (15 Points) |
| Feb. 23    | Topic: Analyzing Accessibility  
Readings: C&M: Ch 9-10; K&G: Ch. 9, GeoDa Intro (on Blackboard); Wang and Luo and Block and Kouba articles  
Assignments Due: Tutorial 9  
Written Ass. 4: Spatial Analysis article discussion (15 Points) |
| March 2    | Topic: Analyzing Patterns of Disease and Vulnerability, Community GIS; Shobugawa, et al, and Hawthorne and Krygier articles  
Readings: C&M: Ch.6-8; 12  
Assignments Due: GIS Assignment 5: Spatial Analysis (20 Points) |
| March 9    | Exam (100 Points); Work on Final Projects  
Assignments Due: none, All late assignments must be completed by this date. |
| March 16   | Topic: Final Presentations  
Assignments Due: Final Project (100 Points, including presentation) |