

Geographic Information Systems

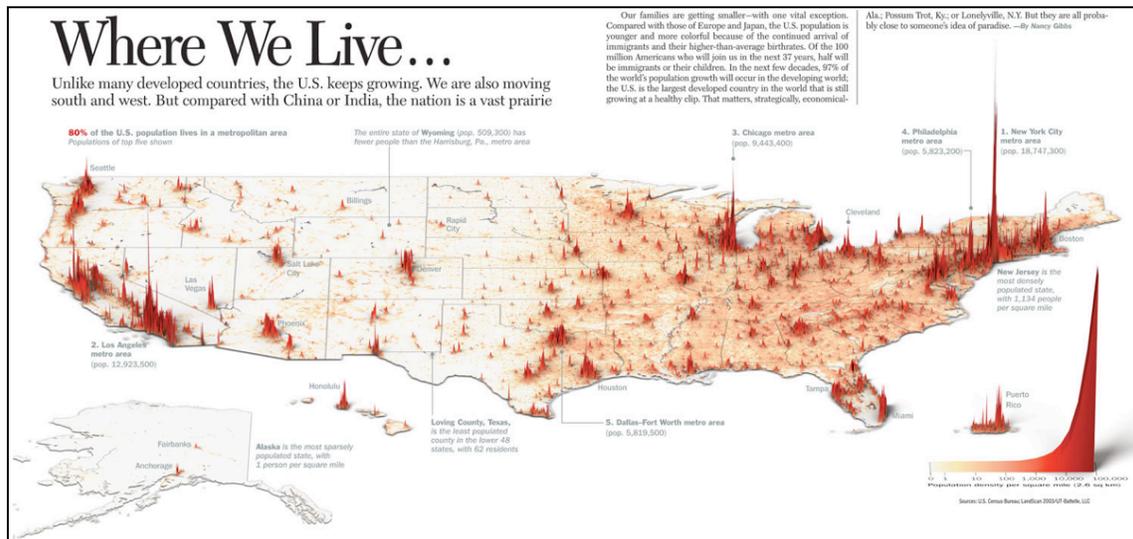
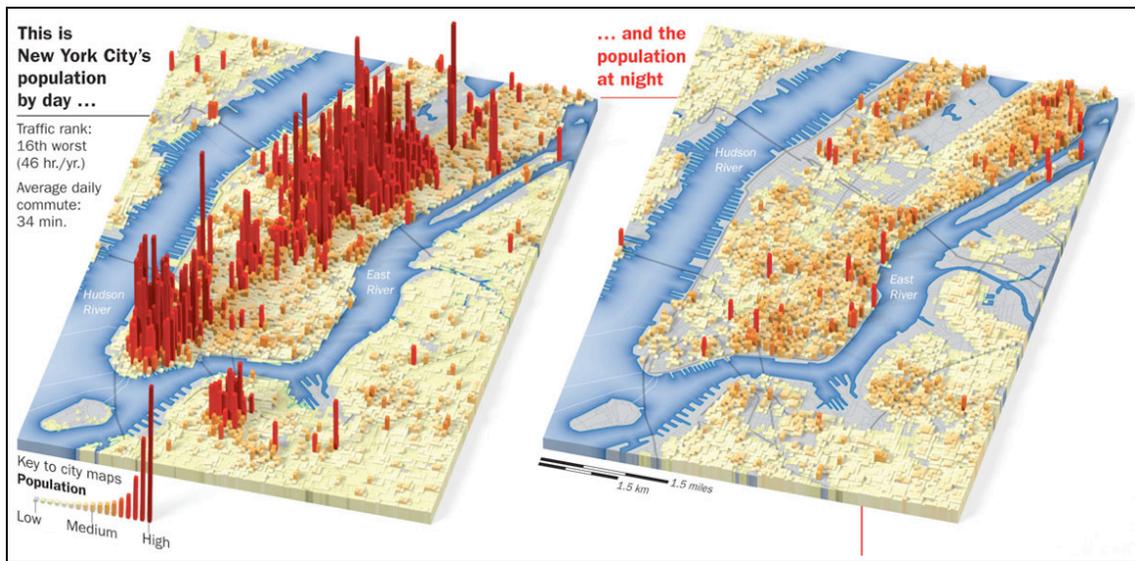
Instructor: Dr. Catherine Riihimaki

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Office hours: M 12 – 3 pm or by email appointment

Meetings: TuTh 10:25 am – 11:40 am, BC 1

Description: Geographic Information Systems describes a computer-based system that aids in the collection, analysis, storage, and distribution of spatial data. Today GIS is used for a wide variety of place-based data sets that contain spatial information such as demographic, economic, political, ecologic, environmental, historical data. In this course, we will learn the principles of GIS and the nuts-and-bolts of using the most popular GIS software package, ArcGIS. Through tutorials and final projects, you will have an opportunity to apply GIS tools to their academic interests across natural sciences, social sciences, and humanities. Two examples of advanced GIS maps are below.



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Texts:

- 1) *GIS Tutorial, Third Edition* by Gorr and Kurland, 2008
 ISBN: 9781589482050
 Cost at <http://gis.esri.com/esripress/>: \$79.95
 Note: This book comes with ArcView 9.3 software. It is critical that every student has a new version of this software, so you will each need to purchase a new version of this textbook.
- 2) *Geographic Information Systems and Science, Second Edition* by Longley, Goodchild, Maguire, and Rhind, 2005
 ISBN: 978-0470870013
 Cost: \$43 from www.amazon.com

Course Requirements: Your performance in this course will be evaluated based on 1 exam, a mid-term project, a final project, weekly homework assignments, and class participation. The final grade breakdown is:

Mid-term exam	15%
Mid-term project	15%
Final Project	30%
Homework	30%
Class participation	10%

I reserve the right to consider trends, class participation, and attendance for anyone on the cusp of two grades.

I expect all of the assignments to be turned in on time, unless you have talked with me in advance. Late assignments have a half-life of two weeks (i.e., if turn it in two weeks late, your maximum grade is 50%). Remember that turning in assignments late is the worst way to lose points!! Please turn in neat work. If you need to type or re-copy handwritten work, please do so.

Final project: A large chunk of your grade will be based on a final project that demonstrates many of the skills that you have learned in the course. The topic will be of your choosing, with guidance from me and any other relevant faculty. All projects must include a significant proportion of original datasets; in other words, you cannot rely completely on pre-packaged data from commercial, governmental or non-profit sources. The submitted project will consist of an in-class poster presentation, a short technical paper and the *ArcGIS* project document and datasets. Start thinking of potential project ideas now!

Attendance: It is to your advantage to attend *all* classes. Tardiness is one of my pet peeves, so come on time! Clear any absences in advance, if possible. Exams will be made up only under extraordinary circumstances. If you have a sports-related conflict, please email me in advance.

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What to bring: For each lecture, bring your notebook (a three-ring binder is convenient for handouts), writing implement, *your computer (with power cord and Ethernet cable!), and your Tutorial book.*

Academic Accommodations: Should you require academic accommodations, you must file a request with the Office of Educational Affairs (BC 114, extension 3327). It is your responsibility to self-identify with the Office of Educational Affairs and to provide me with the appropriate documentation from that office at least one week prior to any request for specific course accommodations. There are no retroactive accommodations.

Academic Integrity: I expect all students to abide by the Drew Standards of Academic Integrity. Although you may discuss course topics and laboratory exercises together, any work that you turn in should represent your own intellectual efforts unless we are specifically working on group projects. Exams and quizzes will be closed book and done independently. Please ask me for clarification if you are unsure of what constitutes plagiarism and/or cheating.

Final thoughts:

A few words of wisdom for this computer-based class:

- Save your work throughout each activity, so that a crash in the program does not undo hours of work.
- Back up your files on a regular (at least weekly) basis. I have heard plenty of horror stories of computer crashes causing months of work to be lost forever. I have also been the victim of computer theft, which instantly took away weeks of data that had not been backed up.
- Keep your computer in good working order. This means making sure that the hard drive has enough free space for your GIS data files; that the memory is not being consumed by such activities as downloading music or movies; and that all aspects of the computer hardware (keyboard, mouse, display, battery, etc.) are functioning properly. Alert CNS and me immediately if you are having any technical difficulties. We will have a computer-care session early in the semester to make sure you know exactly how to maintain your computer.

**Geographic Information Systems
TENTATIVE SYLLABUS**

	Week	Dates	Topic	Text Chapters
Map Design and Navigation	1	Sept 1, 3	What is GIS? Caring for Your Computer	Ch. 1-2
	2	Sept 8, 10	Introduction to ArcGIS Functions Map Basics	Ch. 3 <i>TAL: "Mapping"</i>
	3	Sept 15, 17	Elements of Good Map Design	Ch. 4, 12 <i>The Power of Maps</i>
	4	Sept 22, 23	Data Outputs: Maps, Data, Graphs	<i>Lying with Maps</i>
	5	Sept 29, Oct 1	Mid-term Exam	
Data Creation	6	Oct 6, 8	Organizing Data: The Main Formats	
	7	Oct 13	Coordinate Systems and Projections	Ch. 5, 11
	8	Oct 20, 22	<i>CR at meeting in Portland, OR on Oct. 20</i>	
			Creating New Data: GPS and Surveying	
	9	Oct 27, 29	Digitizing Data	Ch. 6, 9 <i>TAL: "Numbers"</i>
	10	Nov 3, 5	Mid-term Project	
Data Analysis	11	Nov 10, 12	Spatial Analysis: Vectors I	Ch. 14
	12	Nov 17, 19	Spatial Analysis: Vectors II	Ch. 15-16
	13	Nov 24	Spatial Analysis: Rasters I	<i>50-yrs of Satellites</i>
	14	Dec 1, 3	Spatial Analysis: ArcScene	Ch. 13
	15	Dec 8	Final Project Presentations	