

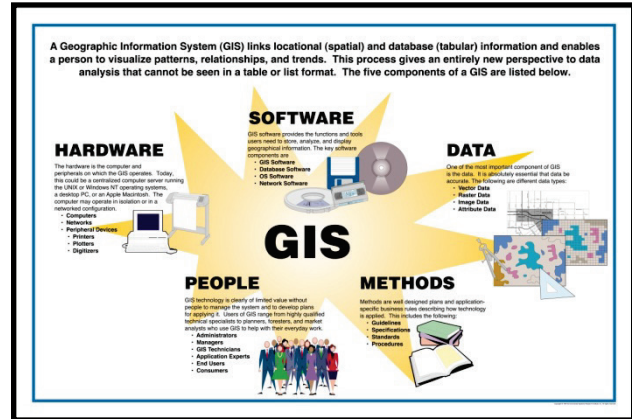
Introduction to Geographic Information Systems (GIS)

GARP 0544-501 – Spring 2013 – CRN 30552

This course provides you with the fundamentals of GIS and digital mapping, including GIS skills, geospatial databases, and geospatial analysis.

The goal of this course is to understand GIS as a useful and flexible tool to solve a wide range of geographic questions and problems.

This course is suitable for a wide variety of disciplines: Regional Planning, Environmental Science, Criminal Justice, Business and Management, Sociology, History, etc.



1) Learning Goals

GIS is many things. At the most basic level, GIS is simply a tool for making intelligent maps using a computer and we will spend a fair amount of time learning the software and data structure. However, GIS is more than just making large colorful maps – you need to consider the information and the underlying analysis to appreciate how space is often a fundamental organizing concept.

- 1) GIS Knowledge
Geospatial concepts and intelligent mapping using GIS software (especially ArcGIS 10), evaluation/acquisition/creation of geospatial data, and geospatial analysis.
- 2) Skills and Critical Thinking
Application of GIS knowledge to relevant real-world situations and problems. Intellectual inquiry, critical analysis, and effective communication using maps.
- 3) Perspective
Space, spatial patterns, and spatial relationships as global organizing concepts. GIS as a tool for a variety of applications and disciplines.

2) Time, Location, Numbers

- GARP 0544-501; CRN 30552, 3 credit hours
- Monday, 18:30 to 21:15, Bates 22 GIS Technology Center

We meet formally once a week!

Therefore, missing class (for any reason) leaves you with a considerable gap in your learning process.

You will spend significant additional time each week outside of class practicing with the software and working on our tutorials, exercises, homework assignments, and GIS projects.

→ There is no time allotted during class meetings to work on GIS projects and homework assignments.

This is a ‘scaffold’ course!

Each week builds the knowledge you need for the next week and it is therefore critical to constantly keep-up with the weekly course material. You cannot ‘skip’ a weekly assignment in this course!

→ We only meet 13 times this semester and you cannot pass this course unless you attend at least 9 class meetings.

This is a high-powered, difficult, and time-consuming elective course with complex content that requires a substantial amount of work to be successful! This is not an easy course to fill-out your schedule!

3) Your Instructor

Dr. Carsten Braun	Email	cbraun@westfield.ma.edu
	Phone and office	413-572-5595, Wilson 201
	Office Hours	MWF 12:00 to 13:00
	Web	www.westfield.ma.edu/cbraun

→ If you feel that you are not progressing as well as you hoped, please feel free to talk to me during my office hours or a mutually convenient time – the sooner the better! Please do not wait until the end of the semester. I’m happy to support you to help you succeed.

4) Prerequisites

No prerequisites, but robust computer and mathematical/statistical skills are necessary to be successful in this course (e.g. knowledge of Microsoft Excel) – please consult with me if you have any concerns.

→ I will not be teaching basic computer skills!

- We will conduct an informal information technology quiz to assess your computer knowledge.
- For some, a course such as MGMT 0107 *Software Applications* before taking GARP 0244 is a good strategy. Note: MGMT 0107 *Software Applications* is also a requirement for the GIS Minor.
- Please note: this course is a prerequisite for GARP0344 (Advanced Geographic Information Systems, Fall 2013 semester).

5) Required Course Resources

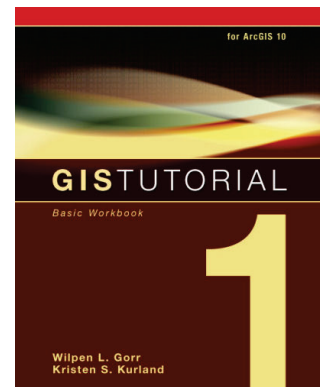
5.1) Textbook

GIS Tutorial 1: Basic Workbook, 4th Edition
W.L. Gorr and K.S. Kurland
ISBN 9781589482593, 428 pp, ESRI Press September 2010

Please note: This is the 4th edition of this tutorial, updated for ArcGIS 10. Do NOT buy a previous edition or used copy – the software and the exercises will NOT work with the current version of the software.

For more information:

<http://esripress.esri.com/display/index.cfm?fuseaction=display&websiteID=184&moduleID=0>



5.2) A dedicated USB flash drive or external HD

A dedicated USB flash drive is required for this course (in order to save your data, exercises, assignments, and GIS projects). Required size: 16 GB or greater.

5.3) Standard 3-ring binder

To organize the weekly course materials and graded assignments/projects.

5.4) Google Account and ESRI Global Account

- Google Account: <https://accounts.google.com/NewAccount>
- ESRI Global Account: <https://webaccounts.esri.com/cas/index.cfm>

6) Course Logistics – The Big Picture

Geospatial software and databases are complex – ‘learning-by-doing’ is therefore the most appropriate and efficient teaching/learning strategy. We will create a cooperative learning environment by supporting each other in order to understand concepts and to solve problems. However, you are always responsible to submit your own original work by the assigned due dates.

I expect a high level of individual effort and engagement. What you get out of this class is primarily a function of the amount of effort you put in. This is not a class where you can sit back and wait for ‘learning to happen’. Instead, you have to consistently and actively engage with the tasks, questions, assignments/exercises, and GIS projects in order to (a) learn to use the GIS software and (b) to understand what a GIS can do for you.

7) Course Logistics – Details

Each week is broadly arranged around a corresponding chapter in your GIS Tutorial (see course schedule below). There will be usually a short introduction lecture, a review of the previous week’s topics and assignments (as needed), and in-class projects and exercises to provide additional information, practice, and context.

Each chapter of the GIS Tutorial takes you through a series of tasks and steps to familiarize yourself with the topic/theme of the chapter. Once you’re finished with that particular section, you can start with the homework assignment or work on the GIS projects.

It is your responsibility to complete the homework assignments and projects by the assigned due dates. About half of the homework assignments are taken from the GIS Tutorial, the other half are specially designed to practice important GIS skills.

GIS Projects

The three GIS Projects are designed to practice important aspects of GIS and geospatial analysis using a problem-solving approach and real-world examples.

- 1) GIS Project 1: Lying with Maps
You have two weeks to complete this project, 10 percent of final grade.
- 2) GIS Project 2: MassGIS Project (land use change analysis)
You have about three weeks to complete this project, 30 percent of final grade.
- 3) GIS Project 3: Final Project
You have one week to complete this project, 10 percent of final grade.

GIS Project 3 (Final Project) takes the place of a ‘traditional’ final exam. You will receive the project on 5/6/2013 and will have 5 days for completion. You have to complete this project on your own.

Assessment

Your final course grade is a function of your performance throughout the entire semester and combines the grades from the weekly assignments and the three GIS Projects.

- 11 weekly assignments 50 percent of final grade
- 3 GIS Projects 50 percent of final grade

Grade Conversion	
A	94-100
A-	90-93
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	60-66
F	0-59

The assigned due dates are mandatory and critical for your success. 10 point deduction for each late day. No exceptions.

The Fine Print

- Attendance is mandatory – missing class is unacceptable.
- If you have to miss class...you have to inform me beforehand.
- The required resources are mandatory.
- The due dates are mandatory.
- Please be on time and don't leave before the end of class.
- No make-up assignments or extra-credit work.

8) What is GIS?

The location of objects and their interactions are (often) not random or independent. Instead, the world is characterized by spatial patterns and relationships. A GIS allows us to visualize (= map) and quantify these spatial patterns and relationships.

Geography

- Where? - Why? - How? things occur on Earth
- Geography is to Space what History is to Time.

Geographic Information

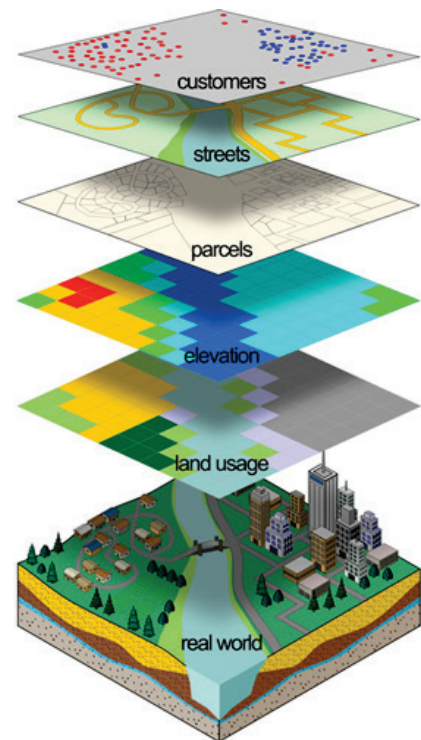
- Information that includes the location of the information in a systematic mathematical format (e.g. street addresses, latitude/longitude, x/y/z coordinates, etc.)

Geographical Information System

- Geographic information that is systematically stored and organized (= inside a database)

➔ If you have geographical information, organized in a systematic manner, then you can use a computer for quantitative geographic analysis and visualization.

➔ *Intelligent and meaningful maps!*



GARP 0544 Spring 2013 Semester Schedule

Week	Date	Topics, Themes, and Tasks		Assignment
Week 1		<i>No class!</i>		
Week 2	1/28	What is GIS?	GIS = hardware, software, concepts, data, analysis, and people	HW #1
Week 3	2/4	Web GIS	Web GIS: Google Earth, ArcGIS Online, and more!	HW #2
Week 4	2/11	GIS Tutorial Ch. 1	Introduction to ArcGIS 10.1: ArcMap and ArcCatalog	HW #3
Week 5	2/19 (Tu=Mo)	GIS Tutorial Ch. 2	GIS Map Design: Classification and Choropleth Maps	HW #4
Week 6	2/25	GIS Tutorial Ch. 3	GIS Outputs = Maps: Creating Meaningful Maps	HW #5
Week 7	3/4	GIS Project 1	'Lying with Maps'	Project 1
Week 8	3/11	<i>No class!</i>		<i>Spring Break</i>
Week 9	3/18	GIS Data I	Online GIS data sources: MassGIS and more!	HW #6
Week 10	3/25	GIS Data II	Creating your own data: Digitizing! (GIS Tutorial Ch. 6)	HW #7
Week 11	4/1	GIS Data III	Online GIS data sources: MassGIS and more!	HW #8
Week 12	4/8	GIS Analysis I	Getting started with quantitative geospatial analysis.	HW #9
Week 13	4/15	<i>No class!</i>		<i>Patriots Day</i>
Week 14	4/22	GIS Analysis II	Spatial Analysis: GIS Tutorial Ch. 9	HW#10
Week 15	4/29	GIS Analysis III	Geoprocessing: GIS Tutorial Ch, 8	HW#11
Week 16	5/6	Review and Reflection	What is GIS? Intelligent and Meaningful Maps!	

Notes

- The due dates for the homework assignments and GIS Projects are specified in the instructions.
- Adjustments to the course schedule, requirements, and assessment may be necessary to account for situations that arise over the course of the semester.

Course Website

<http://www.westfield.ma.edu/cbraun/teaching/introduction-to-gis/>

GIS Resources

<http://www.westfield.ma.edu/cbraun/resources/gis-resources/>