

GTECH 732 – Advanced GIS

Fall 2014

Tuesdays, 5:35 – 8:15 PM

Place of Instruction:	Hunter North, Room 1090B, small lab
Credits:	3
Instructor:	Carsten Kessler, carsten.kessler@hunter.cuny.edu
Office Hours:	Tuesday 3 – 5 PM
Office:	HN 1026
Prerequisites:	GTECH 709 – Introduction to GIS (or equivalent)

Course Overview

This course will examine the principles of geographic information systems (GIS) including an overview of data structures, data types, methods of data analysis, cartographic modeling, and object-oriented GIS. It will build on the knowledge acquired in the introduction to GIS course, which is a prerequisite. Instead of weekly lab assignments, students will work on 5 larger lab assignments that simulate small GIS projects from practice. The primary software used will be ArcGIS. There will be no incomplete for this course. Grades will be assigned based on the work that is completed.

Required textbook

Paul Bolstad 2012: *GIS Fundamentals: A First Text on Geographic Information Systems*. Eider Press. 4th edition. ISBN: 978-0971764736

Expected Outcomes

By the end of the course it is expected that students will be able to synthesize and integrate concepts of GIS theory and methodology, including data models, data structures, topology, and spatial analysis. Additionally, students will learn to synthesize and integrate information from the GIS/GIScience literature, and demonstrate a conceptual and working knowledge of spatial analysis operations, including mathematical modeling, GIS-based simulation, interpolation, and space-time representation/analysis. Students will utilize the skills they learn to develop advanced GIS software skills, particularly in ArcGIS, as well as intermediate to advanced scientific computing skills. The primary goal of this course will be to prepare students advanced use of GIS technologies required for graduate work and advanced GIS positions.

Criteria for Evaluation

Midterm	20%
Abstracts	10%
Labs	40%
Final project	30%

The course will follow the CUNY grading policy that can be found in the online undergraduate/graduate catalog at <http://catalog.hunter.cuny.edu/>.

Policy on Incomplete (IN) and Credit/No-Credit (CR/NC) grades

A final grade of IN (incomplete) will not be given except under the most extraordinary, and documented, circumstances CR/NC is not available to students enrolled in GTECH 732 or any other graduate-level course in the Hunter College School of Arts & Sciences.

Course Policies

Communication

All email messages about this course should include GTECH 732 in the subject line and be signed with your full name.

Web-enhancement

Everything pertaining to this course will be communicated through BlackBoard. You are required to check the BlackBoard course site on a daily basis. All changes to the syllabus will be announced on the course home page. All lecture and lab materials are accessible through BlackBoard, and this is also the place where you upload your assignments. Your exams and lab assignments will be graded based on what you have uploaded to BlackBoard and this is where you will find your grades and may access course statistics that help you to assess your standing at any given time.

Late Policy

Labs and the answers to the questions should be emailed on the due date before the beginning of the class at 5.35pm. Late work will be downgraded 10% for each day late after the due date. These rules will also be applied to homework and abstracts. If you get behind in this course, it will be difficult to catch up. If you get behind for any reason talk to the class instructor early. Unless for a serious documented emergency reason, requests for handing in late work cannot be honored.

Lab Access

The lab (room HN 1090B) is open 7 days a week, 24 hours a day, and students with appropriate access are entitled to work in these labs when the labs are not being used for teaching. Additional information on labs and lab policies is available here:

<http://www.geo.hunter.cuny.edu/techsupport/rules.html>

Please ensure you have a geography account – login and password. You will still be responsible for handing in the labs on time if your account is suspended because of non-compliance.

Class Climate

Hunter has made a conscientious effort to increase diversity in the student, staff and faculty member populations. To ensure that all class members feel welcomed and equally able to contribute to class discussions, we will all endeavor to be respectful in our language, our examples, and the manner in which we conduct our discussions and group work.

If you have any concerns about the climate of the class, please contact me.

Hunter College Statement on Academic Integrity

Hunter College 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 CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Hunter College regulations. Be sure and reference all material you use. If you have any questions, please contact me!

Students with a Disability

If you have any type of disability (emotional, medical, physical, learning, etc.), there are support systems, resources, and accommodation actions available to you. If you wish to access any of these supports, resources or accommodations, I encourage you to contact the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. Please Note: You are under no obligation to disclose your disability.

Syllabus Changes

Except for changes that substantially affect implementation of the evaluation (grading) statement, the current syllabus is a guide for the course and is subject to change with advance notice. All changes will be announced on Blackboard.

Abstracts and readings

You are required to write three (3) one page typed abstracts over the course of the semester. The abstract should be not more than one page, typed, single-spaced using one-inch margins and 12 point type. The abstracts will summarize the following papers:

1. Dawn J. Wright, Michael F. Goodchild, James D. Proctor: GIS: Tool or Science?
2. Martin Raubal and Stephan Winter: Enriching wayfinding instructions with local landmarks
3. Renée Sieber: Public Participation Geographic Information Systems: A Literature Review and Framework

Additional papers:

- ESRI: An ArcGIS Address Data Model for the City of Calgary
- William Sprouse: Database Design Primer – A Beginner’s Guide to Creating a Database
- John E. Harmon, Steven J. Anderson: The Design and Implementation of Geographic Information Systems. Chapter 3: Designing the GIS Database Schema
- Peter Batty, Richard G. Newell: GIS Databases are Different
- Arthur Chance et al.: An Object-Oriented GIS - Issues and Solutions
- Peter Batty: Object-orientation: Some Objectivity, Please!
- U Melbourne: Spatial Data Acquisition – Specific Theory
- ESRI: Working with the Geodatabase: Powerful Multiuser Editing and Sophisticated Data Integrity

- GE Energy: Managing change in the world of spatial data – the long transaction
- ESRI: Managing Workflow with Versions
- David G. Theriault et al: Integrated Data Capture
- Richard G. Newell & Tom L. Sancha: The Difference Between CAD and GIS
- Mark E. Easterfield et al.: Version Management in GIS – Applications and Techniques
- Arthur Chance et al.: An Overview of Smallworld Magik

All papers will be available through the Hunter library eReserve.

Tentative Schedule – subject to change!

Week	Date	Topic
1	2-Sep	Introduction
2	9-Sep	Introduction to Modeling with GIS
3	16-Sep	Data models for GIS: Cartographic and GIS Data Structures
	23-Sep	No class – classes follow a Friday schedule
4	30-Sep	Data models for GIS: Issues of Spatial Data Models
5	7-Oct	Modeling and Simulation in an Object-oriented GIS
6	14-Oct	Data Input, Storage and Editing
7	21-Oct	Spatial Analysis
8	28-Oct	Midterm
9	4-Nov	Statistical Surfaces
10	11-Nov	Point Pattern Analysis
11	18-Nov	Space and time
12	25-Nov	Networks
13	2-Dec	Modifiable Areal Unit Problem (MAUP)
14	9-Dec	Special topics in advanced GIS
	16-Dec	Reading day
15	23-Dec	Final project presentations