GEOS/EUGS 470: Geographic Information Systems II, Fall 2007

SYLLABUS

Class Instructor: Dr. Mark J. Chopping
Contact Information: Phone: (973) 655-7584
Office: 350C Mallory Hall (ML 350C) Hours: R 11:30 – 3:00 pm OBA.
Email: chopping@pegasus.montclair.edu --prefix Subject with ‘GIS:’

Duration Classes start Monday, September 5 (September 6 is Labor Day). All classes end on or before December 13. Classes & practicals will be held in FI204, 8:15 - 10:45 pm.


Internet The course website is http://csam.montclair.edu/~chopping/gis and practical assignments and data sets will be distributed via this medium. A login ID and password will be distributed at the first meeting of the class. Students are expected to use the Internet as a resource whenever appropriate (e.g., for looking up unfamiliar terms, following up on case studies and researching applications) – but plagiarism will NOT be tolerated: if you use someone else’s work, you must cite the source.

Synopsis EUGS470 provides an introduction to Geographic Information System (GIS) technologies and applications, including GIS, Remote Sensing and Global Positioning Systems, GPS) to aid in both study of the environment and solving of practical issues. Geographic information systems (GIS) have been described as "simultaneously the telescope, the microscope, the computer; and the Xerox machine of regional analysis and synthesis of spatial data" (Abler, 1988). In essence GIS are "automated systems for the capture, storage, retrieval, analysis, and display of spatial data" (Clarke, 2000). This course provides an intensive introduction to GIS. The main objectives of the course are to examine the concepts, theory, vocabulary and evolving applications of GIS and to build a solid understanding of theory and capability. The course will involve a mixture of lectures and hands-on practical experience. The course will thus cover both the principles and the practice of GIS on a roughly 50:50 basis.

Success No-one can teach you GIS. This is something that you have to teach yourself. You can learn a huge amount from books and web sites but there is nothing like experience -- practical work – to turn yourself into a GIS expert. Note that you will be examined on the topics covered. You will need to make notes in class – please do not rely solely on the lecture notes provided (if any) and you will have to read and surf around the topics. This is a great opportunity to add a highly marketable skill to your resume.

Labs & Assignments You should aim to spend 2-3 hours per week in the GIS Lab familiarizing yourself with GIS software packages and performing practical GIS work: assigned coursework and the semester project. The skills you will learn through this are highly marketable in today’s geospatial and environmental industries and ability with GIS is regarded as a prerequisite for many jobs. Lab assignments are an integral part of this course and each one is assigned points based on relative difficulty. No late assignment returns will be accepted without documented reasons. GIS Lab. hours are posted on the EAES website.

Grading Exams (2): 25% Labs/Assignments: 25% Project: 50%
A grading spreadsheet will be available on the course web site
The exam format will be multiple choice questions and a number of short answer essay questions. Examinations may be taken late only with documented reasons.
## Time Allocation for Classes, Lab. and Project Work

<table>
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<tr>
<th>WEEK</th>
<th>DAY</th>
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<th>Topic / Practical</th>
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| 1    | W   | 09/05  | GIS Overview: We Have Problems – Are there GIS Solutions?  
Nuts’n’Bolts’n'Numbers: Digital Representation of Geographic Information.  
Intro. to the class project: Siting Wind Farms  
Assignment 1: Interpolating imported text XYZ data to a Digital Elevation Model (DEM); Virtual GIS & Landscape Fly-Throughs |
| 2    | W   | 09/12  | Land cover change in New Jersey, 1972 - 1995  
Practical: Assessing Land Cover Change; GIS data & operations  
Class Project: Siting Wind Farms (GIS issues/teams);  
Course Project work (CPW) |
| 3    | W   | 09/19  | Land cover change in New Jersey, 1972 - 1995  
Practical: Digital data storage  
Finding project data and METADATA (CPW)  
Assignment 2: Raster Site Selection: GIS data & operations |
| 4    | W   | 09/26  | Building a GIS: Finding Data (CPW)  
Practical: Assig. 2 + Summary Operation, Course Project work. |
| 4    | W   | 10/03  | Graphical Spatial Modeler: Raster Data Processing  
Practical: The Imagine Spatial Modeler/Assignments/CPW. |
| 5    | W   | 10/10  | Maps, Reference Systems & Projections  
Practical: Geometric Transformations (raster maps). |
| 6    | W   | 10/17  | Focus on Practical GIS work (Course Projects) + "clinic". |
| 7    | W   | 10/24  | Guest lecture: Peter Winkler: "Kestrel habitat mapping with GIS"  
Practical: Landscape Project; Course Project work. |
| 8    | W   | 10/31  | Building a GIS: Data Entry, Editing & TOPOLOGY  
Practical: Topological Relations, Course Project work. |
| 9    | W   | 11/07  | **Mid-Term Exam (preceding topics only)** |
Virtual GIS, Visualization & Presentation of Geographic Information.  
Practical: Course Project work. |
| 11   | W   | 11/21  | Computer & GIS Programming*  
Practical: GIS Programming (VB, C, AML, GML, SML, Avenue) |
| 12   | W   | 11/28  | Uncertainty and Data Quality*  
Practical: Course Project work |
| 13   | W   | 12/05  | **Student Course Project Presentations** |
| 14   | W   | 12/15  | **Final Examination** |

*may be CPW

11/22-11/25: Thanksgiving; no classes  
12/13: Official End Of Classes.  
12/14-20: Examination Period  
12/20: Official End of Semester.  
*This schedule (10/17/07) is subject to update/revision.*