Course Syllabus
Introduction To GIS – GE132/ES190/US134
Fall Semester, 2011

Instructor
Lynn Carlson
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Office Hours: Tuesdays 2:30 – 4:30 pm
or by appointment
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Lecture Room:  MacMillan Hall Room 101            Tuesday, 1:00 – 2:20
Laboratory Room: MacMillan Hall Room 105        Thursday, 1:00 – 2:20 (Section 1)
                                                       TBD                              (Section 2)

Course Objective: To provide an understanding of the basic concepts and uses of GIS technology so that spatial analysis can be incorporated as an additional aspect of students’ research and studies.

Course Description: A Geographic Information System (GIS) is unique in that it enables the examination of data which have geographic location as an inherent property. A GIS is much more than just a mapping software program. Providing a suite of tools for manipulating, analyzing, visualizing and illustrating geographic (spatial) data, the utilization of a GIS reveals relationships, trends and patterns that are not apparent in written or tabular format. Analysis with a GIS generates answers for simple to complex questions such as: where is the best location for a new development?; which residents would be impacted by a change in local zoning?; where has the incidence of Lyme disease increased over time?

In this class, you will learn about basic GIS concepts including spatial data structures, data sources and transfer methods, projections and coordinate systems, georeferencing, metadata, supporting software, global positioning systems, the integration of remote sensing and GIS, as well as fundamental spatial analysis techniques such as overlay, extraction, and interpolation. Concepts presented in lecture will be put into practice through hands-on laboratory exercises utilizing the GIS software product ArcGIS 10.x (ESRI, Inc.). The culmination of the course is the presentation of your original research project employing the methods learned.

Prerequisites: It is expected that students will have a general knowledge and familiarity with personal computers, computer terminology, files and directories, and the Windows XP operating system.

Students are strongly encouraged to engage the assistance of a professor within their respective department to assist in defining and guiding their research project.
Course Assessment:

*Lab Reports*
- Due during your lab period one week after the lab is handed out
  20% of grade

*Proficiency Examination*
- Handed Out October 18 – Due October 25 by 1:00 pm - NO Exceptions
  25% of grade

*Lightening Talk – Case Study*
- To be assigned – initial presentations will start September 27
  5% of grade

*Quiz*
- November 22
  10% of grade

*Research Project*
- Project Progress Report #1 **Due October 11**
  5% of grade
- Project Progress Report #2 Update **Due November 1**
  5% of grade
- Oral Presentations (12-15 min) **November 29 & December 1 & December 6**
  10% of grade
- Final Printed Research Poster (**DUE AT NOON No Exceptions**) and Formal Poster Session
- Function **December 8**
  15% of grade

*Class Participation*
- Attendance to class and labs and engagement in the material
  5% of grade

*Late Policy*
- A deduction of 2 points per day will be made on lab assignments and research progress reports handed in after the due date. The mid-term and the research poster must be handed in on time or they will not be accepted.

*Recommended Texts:*


*Other Materials:*
- optional: external flash/HDD
Lecture and Lab Topics (subject to change):

* (Lecture is always in MM101, Lab is always in MM105)

September 8
Introduction and course overview. Examples of GIS Applications

September 13
Lecture 1: Defining GIS and Introduction to Spatial Data File Formats
Lab 1: The Basics of ArcCatalog and ArcMap

September 20
Lecture 2: Projections and Coordinate Systems
Lab 2: Coordinate Systems and Map Projections in ArcGIS

September 27
Lecture 3: Tabular Data Design, Functions, Pitfalls and GeoProcessing
Lab 3: Working with Tables, Queries, and Basic Geoprocessing Tools

October 4
Lecture 4: Data sources and data collection – where to get data and how to create your own
Lab 4: Creating and Editing new spatial data files in ArcMap and ArcPad (the latter is weather dependent)

October 11 Project Progress Report #1 Due
Lecture 5: The Raster Data File Format and Raster Analysis
Lab 5: The Spatial Analyst Extension and Model Builder

October 18 PROFICIENCY EXAM HANDED OUT
Lecture 6: Potpourri (Metadata / Georeferencing / Geocoding / Network Analyst)
Lab 6: No formal lab assignment. Work on Exam

October 25 Exam Due At 1:00 PM NO EXCEPTIONS
Lecture 7: Interpolation and Surface Modeling
Lab 7: Interpolation Methods

November 1 Project Progress Report #2 Due
Lecture 8: Exam Review / The Geodatabase
Lab 8: Building a Geodatabase

November 8
Lecture 9: Cartographic Design
Lab: Work on research projects

November 15
Lecture 10: Basics of Remote Sensing
Lab: Work on research projects

November 22:
Lecture 11: Quiz / Topic Wrap Up
Lab: Work on research projects

November 24:
Thanksgiving Recess – No Labs
November 29:
Project Presentations

December 1:
Project Presentations

December 6:
Project Presentations

December 8:
**Final Poster Due at NOON (No Exceptions) and Formal Public Poster Session 1:00 – 2:30 pm**