Florida International University, Department of Earth and Environment

GLY 3759: Visualizing our World with GIS (3 credits)
GIS Teaching Lab, GL 274, Tu/Th 9:30-10:45AM
Office Hours: Wed: 10-12 and Thurs.:2-4PM or by appointment

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Course Syllabus

The material below contains important information for this course. Please read this material and retain this document for future reference.

Course Description

This course will explore important topics in the earth and environmental sciences through the use of Geographic Information System (GIS) software. Topics will include: plate tectonics, earthquake, volcanic, and hurricane hazards, analysis of urban sprawl with satellite imagery and aerial photography, and South Florida water resources. Students will be introduced to the various geospatial data types and the functions of a GIS.

This course is meant for undergraduate students with minimal or no previous GIS experience. Hands on exercises will be performed with the popular and simple to use ArcGIS 10.2 software in the FIU GIS teaching laboratory.

Learning Outcomes

- Learn basic display and query functionally of geospatial and tabular data in ArcGIS
- Learn to apply the scientific method to earth science topics such as plate tectonics, natural and environmental hazards, and water resources in the GIS computing environment.

Prerequisite Experience:

Microcomputer experience (MS Windows, MS Office).

Required Textbooks:

A. Hall, M. K., C. S. Walker, A. K. Huth, R. Butler L. P. Kendall, and J. S. Jenness, *Exploring the Dynamic Earth: GIS Investigations for Earth Sciences, ArcGIS Edition*, Thompson Brooks/Cole, 2007. ISBN 0495115096 (**Must be purchased by week 3**)
B. Hall, M. K., C. S. Walker, L. P. Kendall, J.A. Weeks, and J. S. Jenness, *Exploring the Tropical Cyclones: GIS Investigations for Earth Sciences, ArcGIS Edition*, Thompson Brooks/Cole, 2007. ISBN 0495115436

These books are required. Make sure that you purchase the latest (ArcGIS 9.x) version of the textbook. You will need to bring the text to class every day and complete and turn in the assigned exercises in the book. I strongly recommend that you purchase a new text. **If you purchase a used text, make sure that the previous owner has not written in it**. Each day's reading assignment should be read before the start of the next lecture.

Supplemental Reading

C: ESRI Virtual Campus free short course: *Getting Started with GIS (for ArcGIS 10)*

- Available at: http://training.esri.com
    - Search for course in the Find Training box. The course is free, but you will be required to register.

D: ArcGIS manuals:

ESRI provides an excellent set of documentation. It can be accessed via the following:

- From the Help menu in ArcGIS (select ArcGIS Desktop Help)
- From the Windows All Programs Menu (ArcGIS → ArcGIS for Desktop Help)
- Online at http://resources.arcgis.com/en/help/main/10.2/
    - On the menu left bar Click on Desktop→ Mapping

I recommend that you start to familiarize yourself with the chapters under *Mapping* starting with *Introduction* and *Working with ArcMap*

Additional readings from handouts and the WWW will be assigned during the term.

Computer Resources:

This course will utilize ArcGIS 10.2 installed in the GIS lab in GL274. All students will need to get accounts. In addition to the in-class exercise time, you may utilize this lab during times when it is not scheduled for other classes. See http://gis.fiu.edu for the current term lab schedule. Course resources will be maintained in the P: drive on the GIS lab servers.

Software licenses for student at home use:

ESRI, Inc. offers a 1-year license for students of universities with a site-wide license. The use of this software is limited to educational purposes, and no commercial use is allowed. Go to http://gis.fiu.edu/services/software-licenses/ for more information. If you utilize this option, you will need to install the *Saguaro tools* custom toolbar package located in the ArcGIS Resources folder in the P:GLY3759 folder.

Course Organization and Grading:

The grade in this course will be based on a weighted average of the following: attendance (10%), exercise reports (50%), quizzes and exams (40%).

The course will consist of alternating lectures on theory and hands-on GIS mapping exercises.

- Attendance is required. Students are expected to arrive on time. I will be taking roll at the beginning of each class.
- Exercises will normally be due at the beginning of the next day's lecture, but may be turned in as soon as they are completed at the end of each day's class. Exercises will be graded for completeness and passed back the in next class. Exercises turned in after the due date will be marked down by 25% for each class meeting that they are late after the due date.
- Quizzes and exams will cover concepts covered in the lectures and exercises. Quizzes will be held during the 1st 15 minutes of class and will be announced during the previous class. **Makeup quizzes will not be offered except in extraordinary circumstances.**

Grades will be computed as follows (subject to change):
A: 100% - 90%; **B:** 89% - 80%; **C:** 79% - 65%; **D:** 64% - 50%; **F:** 49% - 0%.
Plus and minus grades will be assigned for the upper and lower thirds of each interval.

Important University Policies That Apply to This Class

Academic Misconduct

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of Florida International University.

All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the following procedures.

Tentative Schedule: (8/23/13Subject to change)

Week 1 Aug 26,28	Organization: Introduction to GIS and computerized mapping. Geospatial data. Map Concepts *Reading assignments*: **A:** Introduction, pg: iii-xii; **C:** Module 1 and 2; **D:** Mapping→Introduction
Week 2 Sept 3,5	Getting Started with ArcGIS: Guided Tour of ArcGIS software *GIS Exercise*: Getting Started: Modules 1 and 2 *Reading assignment*: **C:** Module 3;
Week 3 Sept 10,12	Analysis in a GIS *GIS Exercise*: Getting Started: Module 3 *Reading assignment*: **A:** Unit 1: pg 1-27
Week 4 Sept 17,19	***15 min Quiz 1: GIS Basics*** **(beginning of class)** Evidence for Plate Tectonics: Topography, volcanoes and earthquakes *GIS Exercise*: Activity 1.2, Investigating Earth's Clues, pg 5-18 Activity 1.4, Analyzing Plate Boundaries, pg 25-28 *Reading Assignment*: **A:**Unit 2: pg 29-47
Week 5: Sept 24,26	Measuring Plate Motions *GIS Exercises*: Activity 2.2, Investigating Seafloor Age, pg 33-33 Activity 2.4, Investigating plate motion, pg 39-46 *Reading Assignment*: **A:** Unit 3: Earthquake Hazards, pg. 49-80
Week 6 Oct 1,3	***15 min Quiz 2: Plate Tectonics*** **(beginning of class)** Earthquakes and Earthquake Hazards *GIS Exercises*: Activity 3.2, Deadly earthquakes, pg 59-65 Activity 3.4, Seismic risk and society, pg 73-80 *Reading Assignment*: **A:** Unit 4: Volcano Hazards, pg. 81-111

Oct 3:	**Last Day to Drop with a DR grade**
Week 7 Oct 8,10	Volcanoes and Volcanic Hazards *GIS Exercises*: Activity 4.2, Deadly volcanoes, pg 91-96 Activity 4.4 Volcanoes and climate, pg 105-111 *Reading Assignment*: **A:** Unit 5: Tsunami Hazards, pg 113-142
Week 8 Oct 15,17	Tsunami Hazards *GIS Exercises*: Activity 5.2, Deadly Tsunamis, pg. 119-125 Activity 5.4 Tsunami Warning, pg. 135-140 Activity 5.5 Tsunami Warning, pg. 141-142 *Reading Assignment*: **B:** Recipe for a Cyclone, pg 1- 48
Week 9 Oct 22,24	***15 min Quiz 3: Solid Earth Hazards*** **(beginning of class)** Tropical Cyclone Formation *GIS Exercises*: Activity 1.2, pg 11-14; Activity 1.4, 24-27 *Reading Assignment*: **B:** Unit 2 The Life of a Cyclone, pg 31-47
Week 10 Oct 29,31	The Life Cycle of a Tropical Cyclone *GIS Exercises*: Activity 2.2, pg 35-40; Activity 2.4, pg 45-48 *Reading Assignment*: **B:** Unit 3, Hurricane Hazards
Week 11 Nov 5,7	***15 min Quiz 4: Tropical Cyclone Formation*** **(beginning of class)** Hurricane Hazards GIS Exercises: Activity 3.2, pg 53-60 Activity 3.4, pg 67-69 + handouts *Reading Assignment*: Activity 4.1, pg 73-83, Handouts, WWW sites, TBA
Week 12 Nov 12,14	Storm Surge GIS Exercises: Activity 4.1, Supplemental Exercises. *Reading Assignment*: Handouts, WWW sites, TBA
Week 13 Nov 19,21	***15 min Quiz 5: Tropical Cyclones Hazards*** **(beginning of class)** Understanding remote sensing data: Aerial photography and satellite imagery *GIS Exercise*: Investigating South Florida's environment with satellite imagery and aerial photographs. *Reading Assignment*: Handouts, WWW sites, TBA
Week 14 Nov 26	South Florida environment and water resources. Gridding and contouring of point data. *GIS Exercise*: Raster Analysis with the ArcGIS Spatial Analyst Extension *Reading Assignment*: Handouts, WWW sites, TBA
Week 15 Dec 3,5	Tentative: Sea Level Rise and Florida *Reading Assignment*: Handouts, WWW sites, TBA ***15 min Quiz 6: Raster Analysis and Remote Sensing*** **(beginning of class)** All assignments due.
Dec 10	***Final Exam (tentative) 9:45 -11:45 AM***