

Florida International University, Department of Earth Sciences

**GLY 3759: Visualizing our World with GIS (3 credits)**

Summer A Term, 2008

Time T/H 3:30-6:15 PM

GIS Teaching Lab, GL 274 (2<sup>nd</sup> floor of the Green Library)

Instructor: Dr. Dean Whitman  
Office: PC 325A, Tel: 348-3089  
E-mail: whitmand@fiu.edu

Office Hours: TBA, Before class or by appointment

**Course Syllabus**

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

**Course Description/Learning Outcomes**

This course will explore important topics in the earth 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 9.2 software in the FIU GIS teaching laboratory.

**Prerequisites:**

College Algebra and Trigonometry (MAC 1105 & MAC 1114), 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
- 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

The books below are ArcGIS Extension Workbooks. They may be purchased on-line from ESRI press for \$29.95-\$49.95 each, at: <http://gisstore.esri.com/> (click on *ArcGIS Documentation*). \* Electronic versions (PDF) of these books are available for free on the GIS Lab Public server (P: drive) in folder:

**P:/ArcGIS9\_Manuals/ESRI\_Library/ArcGIS\_Desktop/**

C. *Getting\_Started\_with\_ArcGIS.pdf*, Scott Crosier, Bob Booth, Katy Dalton, Andy Mitchell, Kristin Clark, 265 pages, ESRI 2004.

- This text contains tutorial exercises. Data for these exercises may be found in P:/ArcGIS9\_Manuals/ArcTutor/Getting\_Started/

D. *Using\_ArcMap.pdf*, Scott Crosier, Bob Booth, Katy Dalton, Andy Mitchell, Kristin Clark, 565 pages, ESRI 2004.

- This text contains 5 quick start tutorial exercises. Data for these exercises may be found in **P:/ArcGIS9\_Manuals/ArcTutor/Map/**

### Lecture attendance:

Attendance at all lectures is required. Students will be allowed to miss a total of one class and only for a valid emergency reason and with prior notification. I will be taking roll at the beginning of each class. Please be courteous to others and me in class: arrive on time to lectures, and **turn off all beepers and cellular phones while in class.**

### Course Organization and Grading:

The course will consist of alternating lectures on theory and hands-on GIS mapping exercises. Exercises will 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. Quizzes and exams will cover concepts covered in the lectures and exercises. The course grade will be based on attendance (15%), exercise reports (50%), and exams and quizzes (35%)

### Schedule: (Tentative, subject to change)

May 6	Organization: Introduction to GIS and computerized mapping. Geospatial data. Guided Tour of ArcView GIS software <i>Reading assignment:</i> A Introduction, pg: iii-xii; C: pg ? -xx
May 8	Map Concepts <i>GIS Exercise:</i> Using ArcMap, Tutorial Exercises <i>Reading assignment:</i> A: Unit 1: pg 1-27
May 13	Evidence for Plate Tectonics: Topography, volcanoes and earthquakes <i>GIS Exercise:</i> Activity 1.2, Investigating Earth's Clues, pg 5-18 <i>Reading Assignment:</i> A:Unit 2: pg 29-47
May 15	Measuring Plate Motions <i>GIS Exercises:</i> Activity 2.2, Investigating Seafloor Age, pg 33-33 Activity 2.4, Investigating plate motion, pg 39-46 <i>Reading Assignment:</i> A: Unit 3: Earthquake Hazards, pg. 49-80

May 20	<p><b>15 min Quiz 1: Plate Tectonics (beginning of class)</b>  Earthquakes and Earthquake Hazards  <i>GIS Exercise:</i>  Activity 3.2, Deadly earthquakes, pg 59-65  Activity 3.4, Seismic risk and society, pg 73-80  <i>Reading Assignment:</i> A: Unit 4: Volcano Hazards, pg. 81-111</p>
May 22	<p>Volcanoes and Volcanic Hazards  <i>GIS Exercises:</i>  Activity 4.2, Deadly volcanoes, pg 91-96  Activity 4.4 Volcanoes and climate, pg 105-111  <i>Reading Assignment:</i> A: Unit 5: Tsunami Hazards, pg 113-142</p>
May 27	<p>Tsunami Hazards  <i>GIS Exercise:</i>  Activity 5.2, Deadly Tsunamis, pg. 119-125  Activity 5.4 Tsunami Warning, pg. 135-140  Activity 5.5 Tsunami Warning, pg. 141-142  <i>Reading Assignment:</i> B: Recipe for a Cyclone, pg 1- 48</p>
June 29	<p><b>15 min Quiz 2: Solid Earth Hazards (beginning of class)</b>  Tropical Cyclone Formation  <i>GIS Exercises:</i> Activity 1.2, pg 11-14; Activity 1.4, 24-27  <i>Reading Assignment:</i> B: Unit 2 The Life of a Cyclone, pg 31-47</p>
June 3	<p>The Life Cycle of a Tropical Cyclone  <i>GIS Exercise:</i> Activity 2.2, pg 35-40; Activity 2.4, pg 45-48  <i>Reading Assignment:</i> B: Unit 3, Hurricane Hazards</p>
June 5	<p>Hurricane Hazards  <i>GIS Exercise:</i> Activity 3.2, pg 53-60 and 3.4, pg 67-69 + handouts  <i>Reading Assignment:</i> Handouts, TBA</p>
June 10	<p><b>15 min Quiz 3: Tropical Cyclones (beginning of class)</b>  Understanding remote sensing data: Aerial photography and satellite imagery  <i>GIS Exercise:</i> Investigating South Florida's environment with satellite imagery and aerial photographs.</p>
June 12	<p>South Florida environment and water resources. Gridding and contouring of point data.  <i>GIS Exercise:</i> Raster Analysis with the ArcView Spatial Analyst Extension</p>
June 17	<p>Tentative: Sea Level Rise and Florida</p>
June 19	<p>All assignments due. <b>1 hour Final Exam</b></p>