

# Principles of Geographic Information Systems (GIS)

GEO4/526: Fall 2007, Section 101 - CRN \_\_\_\_\_ or CRN \_\_\_\_\_

No prerequisites

3 credit hours

Instructor: James Leonard, Ph.D.	Time: M 6:30-9:00pm
Phone: (304) 696-4626	Place: HH202
Office hours in Harris Hall 208: MWF 9:30-11:00am; T 2:00-4:00pm; or by appointment	<a href="mailto:leonard@marshall.edu">leonard@marshall.edu</a>

## Course objectives:

- Learn geographic principles that form the foundation of GIS:
  - Globe properties and the graticule
  - Ellipsoids, geoids, datums
  - Map projections
  - Coordinate systems
  - Cartographic design
- Learn the basics of ArcGIS software
- Complete a GIS project

## Required materials:

- Price, Meribeth. 2005. Mastering ArcGIS, 2nd ed. NY: McGraw-Hill. *This will also be used as a textbook for GEO4/529 - Vector Analysis offered in Spring.* Cost = \$60-80
- Readings posted online. Free to download.
- USGS 7.5' Topographic map of Huntington, WV quadrangle. Cost = \$6-10.
- Rulers, colored pencils, calculators, and globes will be supplied by the department.

## Organization of Class Time:

Class time will consist of one or more of the following: 1) presentations of GIS principles; 2) globe and map analysis; 3) ArcGIS exercises.

## Time Outside of Class:

You must attend every class! This class, though, consists of more than simple class attendance. **Expect to spend two hours outside class each week for each class hour** reviewing the lessons, reading the text and articles, studying for exams, completing any unfinished exercises, and preparing your project. You may require extra practice with the ArcGIS software on your own time. The software is available campus-wide in University Computing Facilities Labs. The exercise data is available on a network drive (\\marshall.edu\munet\geography\).

### Software access:

Every Computing Facilities Lab will have ArcGIS available. You may access the Geography Lab in Harris Hall 202 by swiping your ID card. The exercise data is available on a network drive (\\marshall.edu\munet\geography\).

You can access ArcGIS from home! For free! Here's how:

1. Go to <http://support.marshall.edu/tsweb>
2. You may need a little piece of software that takes about 5 seconds to download. If you need it, there will be a pop-up window with the information.
3. Login to the MU Virtual Machine. This will log you in to a MU computer on campus. You will not be able to access data on your home computer from here. The ArcGIS software will be available on this remote computer. The exercise data is available on a network drive (\\marshall.edu\munet\geography\MasteringArcGIS) on this remote computer.
4. If you need to save projects to use on campus, please save them in your V: drive.

### Grading:

Grades will be based on ten exercises assigned during class (20 points each) for 200 points; two exams (100 points each) for 200 points; seven online ESRI Virtual Campus Modules (10-15 points each) for 100 points, and a final project for 100 points. Graduate students will have more extensive graded exercises, exam questions, and projects. Final grades will be determined by the total number of points you have earned:

- A = 600 - 540 points (100-90%)
- B = 539 - 480 (89-80%)
- C = 479 - 420 (79-70%)
- D = 419 - 360 (69-60%)
- F = 359 and below (less than 60%)

Make the best use of the assignments and exams, because there will be **no extra credit** and **no grades will be scaled or curved**.

- This is a senior-/graduate-level course. You will be expected to perform at a high level.

- You must be thorough and complete on all exercises to receive full credit.
- You must master all exercises, textbook and article readings, online course material, lecture material, and ArcGIS skills and concepts to do well on the exams.
- The ESRI Virtual Campus course modules can only be completed by taking mini-exams. You may take each mini-exam as often as you like. As long as you complete the module when assigned, you will get full credit for that module.

### Attendance Policy:

You must attend every class. Exercises assigned during class will most frequently be turned in during the next class period. You must submit assignments by the announced deadlines or you will receive zeros for any such assignments. If you will not be present for an excused reason on a day an exercise is due, you **MUST** turn it in early. **Failure to follow these instructions will result in a ZERO on the missed exercise or project.**

I do not accept unexcused absences. I follow University policy for excused absences. You must provide adequate documentation for any excused absence. Missing 2 days or more (excused or unexcused) probably means failure in this class. **You will be held to the highest standards in regard to academic attendance, participation, and punctuality.**

### Academic Honesty and Plagiarism:

University policy states that any act of a dishonorable nature which gives the student engaged in it an unfair advantage over others engaged in the same or similar course of study is prohibited. You must do your own work inside and outside of this class. Cheating/plagiarism in or out of this class is prohibited. **You will be given a final grade of F for any instance of academic dishonesty.** I am happy to assist you with anything you do not understand or have questions about.

### Withdrawal Policy:

A drop slip signed by me or the chairman of the Geography Dept. must be submitted to the Registrar to receive a W during the period set by the university. After the W period, you may only drop this class by complete university withdrawal. **Failure to follow these university procedures will result in a final grade of F.**

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

Assignments are due at the BEGINNING of the next class period after they are assigned, unless otherwise stated in class.

- Aug. 21: Introduction - What is GIS?; Chapter 1 - Introducing ArcGIS; Jobs in GIS
  - Assignment #1 - Chapter 1 exercises & jobs in GIS

- Aug. 28: Chapter 2 - Working with ArcMap
  - Assignment #2 - Chapter 2 exercises
- Sept. 4: Holiday!
- Sept. 11: Globe properties; Meet with Prof. Leonard about projects
  - Assignment #3 - Globe exercises
- Sept. 18: Ellipsoids, projection, scale; Chapter 3 - Map projections and coordinate systems; ESRI Virtual Campus course: *Map projections and coordinate systems*
  - Assignment #4 - Chapter 3 exercises
  - ESRI Virtual Campus course: Modules 1 & 2
- Sept. 25: Data classification and display; Chapter 4 - Drawing and Symbolizing Features;
  - Assignment #5 - Chapter 4 exercises; data classification exercise
- Oct. 2: Exam review; tie up loose ends
  - ESRI Virtual Campus course: Modules 3 & 4
  - Project Parts 1,2,&3 due today
- Oct. 9: Exam #1
- Oct. 16: Coordinate systems, map scale, scale in a GIS
  - Assignment #6 - Topographic map exercise
  - ESRI Virtual Campus course: Modules 5 & 6
- Oct. 23: Geoids, ellipsoids, datums; Chapter 5 - Working with Tables;
  - Assignment #7 - Chapter 5 exercises
  - Meet with Prof. Leonard about project completion
- Oct. 30: Using GPS with GIS
  - Assignment #8 - GPS exercises
- Nov. 6: Chapter 6 - Queries
  - Assignment #9 - Chapter 6 exercises
  - ESRI Virtual Campus course: *Understanding GIS Queries*
- Nov. 13: Map design principles; Chapter 9 - Presenting Data
  - Assignment #10 - Chapter 9 exercises; Map design exercise
- Nov. 20: Holiday!
- Dec. 4: Finished Projects due; Project presentations
- Dec. 11: Exam #2