Geography 317: Introduction to Geographic Information Systems
Dr. Algeo – Spring 2011

Western Kentucky University

This syllabus is subject to modification up until the first day of the semester in which the course is taught. It is made available for general information purposes only, and any or all parts of it may change before the course is actually offered. If you register for the course, you will receive an updated syllabus from the instructor.

Course Description:

This three credit hour course is an introduction to the principles and applications of computer-based geographic information systems. Spatial information sources, data encoding, storage, management, analysis, and display are highlighted through the application of GIS techniques to problems in a variety of fields, including land use and natural resource management, transportation, and urban and regional planning. Students will become acquainted with both raster and vector models using ArcGIS.

Geog 317 is the second of four courses in the 13-credit hour GIS certificate. For more information on the GIS certificate, please see www.wku.edu/gis

Prerequisite:

Geog 217 or Geog 316 - Fundamentals of GIS

Required Text:

Chang, Kang-tsung. 2010. Introduction to Geographic Information Systems. Boston: McGraw Hill. Fifth edition.

- Yes, you specifically need the fifth edition.
- If you buy a used textbook, make sure that it comes with the data CD.

Other Requirements:

- A thumb drive with at least 1GB of memory to hold your homework and lab exercises. Assignments will be submitted online via Blackboard, so this thumb drive is for storage and back-up purposes only. Work should not be stored on campus lab computers, as it might be removed between sessions. If you are doing all work on your own computer, you do not necessarily need a thumb drive, as assignments may be stored on your computer's hard drive. You should take precautions to back up your work in case of hard disk failure, however.
- You must have reliable access to a recent computer running the Windows operating system and either reliable access to ESRI ArcView 9.3.1 software or the ability to load software I will give you on your computer. The WKU student computer labs provide all software needed for this course, so if you are able to use those labs, you have met this requirement.
- You must have access to a computer with a reliable internet connection. Again, the WKU student labs meet this requirement.

- To submit assignments and labs, you will need to be able to compress files and folders. Newer version of Windows allow you to create compressed folders to which you add files, which are then automatically compressed. If you have an older version of Windows, you may need a program that does zip compression, such as WinZip or PKzip. Shareware versions may be found on www.tucows.com

Course Objectives:

This is not just a course in how to use a software program. To ensure accurate results from the software one must understand the theoretical basis and geographic principles of GIS. After completing this course, a student should be able to:

- Understand and explain to others what GIS is, what the major components of the technology are, and typical applications of GIS.
- Demonstrate an understanding of the geographic basis of GIS through correct use of map projections, coordinate systems, scale, and cartographic generalization for different data sets.
- Understand the principles of the raster and vector data models and be able to create, modify, analyze and map data in both forms.
- Understand and explain the role of topology in the storage and analysis of geographic data.
- Understand the relationship between attribute and feature data and know how both are stored on disk.
- Identify, download, and manipulate into a useable format existing state and national data sets available over the internet.
- Use GIS analysis tools, including spatial and attribute queries and geographic visualization, to explore a data set and formulate a research question.
- Use basic vector analysis techniques, including buffering, overlay, and distance measurement, to solve a geographic problem.

Class Format and Policies:

This course is administered with WKU's Blackboard software, which is accessible at http://ecourses.wku.edu/ . The Blackboard web site will be your entry point for all course materials not contained in the textbook.

All assignments must be uploaded to Blackboard. Assignments emailed to the professor will not be accepted.

Special Note on Blackboard & Web Browsers:

Some web browsers interact with Blackboard better than others. If you receive an error message about an invalid file type when attempting to upload an assignment file, then you need to change the browser version or type of browser that you use. In Blackboard, see the tab "Browser Compatibility" for further information.

Students taking the conventional form of this class benefit from having me present to answer their questions immediately as they work through many of their exercises. Students taking the online version of the class must be prepared to take greater responsibility for their own learning. They must be disciplined and set aside time regularly each week to work on the class. Due dates for work in the online class come every week, just as in the traditional class, and will be enforced; class work may not be left till the end of the semester. Students in the online class must also recognize when they don't understand something and either phone me or email for help. Don't be shy! Let me hear from you! Recognize, though, that communication will be more asynchronous – that is, you are not going to get an answer as immediately as if I were in the classroom with you.

Students should download the PowerPoint presentations for each week and read the accompanying notes. If something isn't clear – please ask about it! The lab component provides students with practice in using the ArcGIS software in a problem-solving environment.

Students have a choice for the midterm and final – they may either join the conventional class in the IE building on WKU's main campus at the scheduled time or they may schedule the exams with a test proctoring center. The DELO test proctoring center on WKU's main campus is in Garret Conference center and is free of charge. Students located away from WKU's campus must locate a testing center in their community (most universities have them) and make arrangements with that center, notifying DELO as well (since they mail out the test). Other proctoring centers typically charge, with the average charge about $20 per exam. While that may seem a substantial fee just to take a test, reflect that you have opted to take an online course, which provides certain other convenience, such as not having to travel to campus. I will provide more details on proctoring as the semester progresses.

Auditing of this course is not allowed.

Schedule Changes

The Department of Geography and Geology strictly adheres to University policies, procedures, and deadlines regarding student schedule changes. It is the sole responsibility of the student to meet all deadlines in regard to adding, dropping, or changing the status of a course. Only in exceptional cases will a deadline be waived. The Student Schedule Exception form is used to initiate all waivers. This form requires a written description of the extenuating circumstances involved and the attachment of appropriate documentation. Poor academic performance, general malaise, or undocumented general stress factors are not considered as legitimate circumstances.

Students with Disabilities

Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services, Garrett 101. The OFSDS telephone number is (270) 745-5004 V/TDD. Please do not request accommodations directly from the professor without a letter of accommodation from the Office for Student Disability Services.

Course Expectations:

GIS skills are best learned through repeated application, so this course is structured to provide you with multiple opportunities to practice and learn GIS skills. Concepts and techniques are generally introduced first in the on-line modules in a "cook book" style that guides your every point and click. That level of GIS use, however, does not represent mastery, so those same concepts and techniques are reinforced through the chapter tasks and exercises, which require you to apply the same skills in a less directed fashion. Finally, the labs require you to synthesize the skills learned in other portions of the courses and to apply them to a new situation. The labs require a higher level of thinking and independent decision making.

Learning is also a collaborative endeavor. There will be times during this semester when your maps or other GIS products will be shared with the entire class for the class to comment on. This peer evaluation serves a dual purpose. It is intended to help the student whose work is critiqued improve their work. It is also intended to help you develop your critical analysis skills, which you can then apply to your own work on a continuing basis.

At the university level, students are expected to devote two to three hours outside of class, studying, reading, and doing assignments, for every hour that they spend in the classroom. This means that you should anticipate spending six to nine *additional* hours each week in activities related to this course. For students taking the online version of the course, you can expect to spend a minimum of eight to twelve hours per week on the course (the three hours of class time, plus the outside class time).

Grading:

The final course grade is based on:

	Weight
7 Modules of ESRI on-line course • A self-paced on-line course that provides an initial introduction to procedures with cook-book style instructions	7%
12 Sets of Chapter Tasks • Selected tasks from the end of each chapter in our textbook. See the Chapter Tasks section of the BlackBoard course for further instructions	13%
12 Sets of Chapter Review Questions • Selected review questions from the end of each chapter in our textbook. See the Review Questions section of the BlackBoard course for further instructions	10%
12 Chapter Quizzes • Quizzes will be taken online.	10%
8 Exercises • Exercises are designed to teach you specific GIS skills and how to put them together for problem solving. They are completed mostly in class, but may require some time outside of class to complete.	15%
5 Labs • Labs are substantial applications of skills learned in the course and require some original thinking. Labs require "synthesis" – using skills to solve problems without being given cookbook-style instructions. This is where you show off what you've learned. They are completed mostly outside of class. • Labs will be graded based on the <u>correctness</u> of the solution and <u>how well the solution is communicated</u> in a map or lab write-up.	15%
Midterm exam	15%
Final exam	15%
Total:	**100%**

The grading scale is as follows:

A (90% - 100%), B (80-90%), C (70-80%), D (60-70%), F (Below 60%)

<u>Timeliness</u>

Students should **start early** on **lab** assignments to allow time for overcoming unanticipated problems. Late labs will be penalized 10% for each day after the due date that they are late. Labs may be turned in up to three days late, but will not be accepted after the third day. All other assignments are due on the assigned date and will not be accepted late. These policies are designed to encourage responsibility, accountability, and assist me in providing you with timely feedback.

Students in the online version of the class who are full-time working professionals and who are required to travel for their job should contact me to work out individual exceptions to the schedule. Verification from a supervisor will be required.

GIS Lab Policies

The GIS lab in IE 301 is available for use any time during the day when a class is not scheduled (schedule posted on lab door). Evening hours will be made available and announced as soon as the lab monitor schedule is finalized. The lab is only to be used only for work related to GIS and remote sensing classes. Work such as term papers for other classes should be done in one of the universities general computer labs (for locations, see http://stech.wku.edu/lablocations.html).

Do not print out PowerPoint presentations on the lab printers!

Do not print papers for other classes or material downloaded from the internet on the printer in the GIS lab. Please help the Department of Geography & Geology keep class costs low.

Food, drink, and tobacco products are strictly prohibited from the lab to protect the university's investment in computer equipment and keep the facility looking nice.

The lab is monitored with cameras to enhance security.

Date syllabus last modified: Jan 18, 2011