Fall 2007/Geography 306
Intermediate Geographic Information Systems
Monday 5 - 9:10 pm

Instructors: Dr. Shawna Dark and Danielle Bram

Email/Phone:

Danielle Bram

danielle.bram@csun.edu / (818) 677-3524

130W Sierra Hall

Office Hours: W 2-3 pm or by appointment

Shawna Dark

shawna.dark@csun.edu / (818) 677–3530

130J Sierra Hall

Office Hours: W 12-1 pm or by appointment

Textbooks

Introduction to Geographic Information Systems with ArcGIS by Michael Kennedy, 2006, John Wiley and Sons, 1st Edition.

Course Website: http://www.csun.edu/~sd1229/

Lecture notes will be available on the course webpage along with class assignments, the syllabus, and the lab schedule. Please check this on a regular basis so you know what is going on.

Description

This course will cover basic principles of geographic data acquisition, processing, and display through digital methods. Students will be introduced to spatial data structures and algorithms, and to examples of current uses of GIS. Labs will give students hands-on experience with ArcGIS. In the last few years developments in computer software, databases, and hardware have enabled scientists and planners to investigate spatial problems, which due to the volume of required data handling, were rarely investigated by manual methods in the past. Geographic Information System (GIS) programs provide a collection of procedures for gathering the locations of events, for analyzing the spatial association of data sets such as slopes, vegetation, or soils, for finding routes in a network and for converting digital information to maps, graphs, or tables for visual examination. With GIS, "what if" kinds of questions about spatial distributions can be effectively examined.

Goals

Students will gain a basic understanding of the various routines of ArcGIS and how these routines can be utilized to perform a variety of geographical analyses. In addition, you will learn the basic concepts of map design and spatial analysis. Students MUST work regularly with the computer even if this means repeating an exercise. There are just too many procedures to be remembered and very few people can survive with only one session at the computer per week.

Basis of Grading

Your skills will be evaluated via midterm exams (multiple choice and short answer), software quizzes, and lab assignments. Lecture and lab will be separated for grading. The items for grading are as follows:

Lecture		*Lab*	
Exam #1	40%	Lab Assignments (13)	40%
Exam #2	40%	Lab Quizzes (5)	30%
Project	20%	Project	20%
		Presentations	10%

Midterm Exams

The midterm exams are not cumulative. You will only be tested on the material since the previous exam. The format for the midterms will be short answer and multiple choice.

Quizzes
There will be three ArcGIS open-book and open-note quizzes. These quizzes will require you to solve problems at the computers using ArcGIS. Each quiz will take about half an hour and will account for a 10% of your final lab grade. These quizzes are meant to be easy, so don't panic!

Lab Assignments:
Each week you will have a lab assignment to turn in. The weeks you are completing your online course, you will turn in your certificate that you receive once you have completed the module and passed the exam. You will have a total of 13 assignments. It sounds like a lot, but the module exams are not too difficult. When we are working on the Kennedy book, I will give you a list of questions directly from the book for you to answer. These are due the following week, a due date will be posted on each lab assignment handed out in class.

Project
You will be required to complete a project for this course. You will have the final weeks of the term to work on your project. You may work on any problem of interest and you may wish to integrate the project with your work in another class. However, do not select a topic that requires you to obtain data that is not readily available. In fact, you would be advised to design your project around data sets that are available over the internet or on our server. A handout about the assignment will be given to you after the first exam. The final format for the project will be a poster that should contain an introduction, data and methods, and results. I will expect each of you to discuss your project ideas with me mid-term so that you know what you will be doing once we begin working on them.

Presentations
You will be required to present your poster to the class at the end of the term. Each student will be given 10 minutes for his/her project, followed by questions and comments from other students. The quality of the presentation will be judged by the class and the instructor, from 1 (poor) to 10 (excellent).

Policy on Late Assignments
Late assignments will be reduced by one point for each day they are late up to a week. After one week I will no longer accept your assignment and you will get a zero for your grade on the assignment.

Academic Conduct
Please note, under no circumstances should you consider any form of cheating or plagiarizing in this course. I **ABSOLUTELY WILL NOT TOLERATE IT**, don't be fooled by congenial approach. If you are caught you will be given a failing grade for the course and you will be reported to the Dean of Social and Behavioral Sciences and also to the Dean of Academic Affairs for disciplinary measures.

Course Level:
In the past, some students have opted not to take an Introductory GIS course and instead to jump straight into the intermediate level course. This is no longer considered acceptable. In order to pass this course, you need to have completed an introductory GIS course at some point in your academic career. If you haven't you will have a very difficult time keeping up on the course material. I will not spend extra time teaching you basic concepts either. If you are concerned about this, I have attached a list of terminology and actions (that you should be able to complete) at the end of the syllabus. If you have concerns, please talk to either myself (via email at the beginning of the course) or Professor Bram.

Tentative Schedule
This schedule may change throughout the semester. It is your responsibility to stay on top of what is going on by coming to class and asking questions if you are uncertain about the schedule. In addition, on the first day of class a detailed lab schedule will be handed out to you.

Date	Topic	Lab Assignment
8/27	*Introduction and Review*	*ArcGIS Modules 1, 2, & 3*
9/3	*Labor Day - No Class*	*-*
9/10	*Geodatabases and other GIS formats*	*ArcGIS Module 4 (Section 1 ONLY) Geodatabase Modules 1 & 2*
9/17	*Finish up with Geodatabase Online Modules* *- Quiz #1*	*Geodatabase Modules 3 & 4 Downloading data, importing to a geodatabase, and create a map assignment*
9/24	*Introduction to Spatial Analysis*	*ArcGIS Module 6 Kennedy:Exercise 6.1*
10/1	*Buffer, Overlay and Extraction* *Quiz #2*	*ArcGIS Module 7: Section 1 ONLY*
10/8	*Exam #1* *Buffer, Overlay, and Extraction Cont.*	*Kennedy: Exercises 7.1-7.4 Download Data & Analysis Assignment*
10/15	*Raster Data Processing* *Quiz #3*	*Spatial Analyst Module #1*
10/22	*Basic Raster Analysis*	*Spatial Analyst Module #2*
10/29	*Introduction to Map Algebra* *Quiz #4*	*Spatial Analyst Module #3*
11/5	*Working with Model Builder*	*ArcGIS Module 7: Section 2 ONLY Model Builder Assignment Projects*
11/12	*Veterans Day - No Class*	*Work on your projects!!!*
11/19	*ArcScene and Beyond* *Quiz #5*	*Projects*
11/26	*Exam #2*	*Projects*
12/3	*Project Presentations*	*Projects*
12/10	*Project Presentations*	*Projects*
12/17	*Project Presentations (if necessary)*	*Projects*

Intended Outcomes
In accordance with best teaching practices, intended outcomes for this course are made transparent to students at the beginning of the semester. Students should be able to demonstrate at least basic competency with knowledge and skill sets listed below in order to earn a passing grade in this course. The assessment and evaluation tools used during the semester, designed to measure your success in acquiring these knowledge and skill sets are listed below each learning outcome below.

Goal A: Building a Knowledge Base
- Students in this course will identify and define key terms and concepts central to understanding of geographic information systems and the analysis (and display) of spatially referenced phenomena.
- Students will be able to define and explain key terms such as: GIS, data models, file structures, map projections, geodatabase, proximity functions, logical operations, and neighborhood functions.

Assessment/Evaluation tool: Lab assignments, lab quizzes, midterm exams
- Students will be able to arrange on a map key elements as well as be able to name and label important geographic locations on maps produced in class.
- Students will be able to identify a variety of GIS software packages

Assessment/Evaluation tool: Lab quizzes, midterms, final project

Goal B: Acquiring Knowledge
- Students will develop skills for acquiring new knowledge.
- Students will recall information presented to them textually, cartographically and through numeric or graphic communication.

Assessment/Evaluation tool: Midterms, lab assignments, final project
- Students will demonstrate their ability to interpret non-textual cartographic information presented on maps on a variety of subjects.

Assessment/Evaluation tool: Midterms, lab assignments, lab quizzes

Goal C: Problem Solving Skills
- Students will demonstrate their problem solving skills.
- Students will analyze spatially distributed phenomena using techniques such as buffering, nearest neighbor analysis, reclassification, and overlay.
- Students will be able to interpret results from spatial analysis and apply these results to explanations of real world phenomena.

Assessment/Evaluation tool: Lab assignments, lab quizzes, final project
- Students will compare the similarities and differences between and among various spatial phenomena using common cartographic and analytical techniques.

Assessment/Evaluation tool: Lab assignment, lab quizzes, final project

Goal D: Communicating Knowledge
- Students in this course will be able to communicate ideas by using words, numbers, maps and other graphic devices.

Assessment/Evaluation tool: Lab assignments, lab quizzes, final project
- Students will construct a series of sophisticated and legible maps.

Assessment/Evaluation tool: Lab assignments, lab quizzes, final project
- Students will effectively communicate facts, ideas and statistics using maps and graphic devices.

Assessment/Evaluation tool: Lab assignments, lab quizzes, final project

Geography 306
Knowledge Base

Below is a list of terms that you should be familiar with BEFORE taking an intermediate GIS course. We will spend the first three weeks of this course reviewing some of this material in more depth. However, if you look at this and you do not know most of the terminology on it, then you should drop this class and sign up for the beginning course.

Terminology:
Geodatabase
Shapefile
Arcinfo Coverage
DEM
DOQQ
DRG
Topology
ArcGIS
ArcMap
ArcCatalog
Map document (*.mxd)

Things you should be able to do:
Copy and delete files from ArcCatalog
Open ArcCatalog
Open ArcMap
Add data to an ArcMap session
Create a map using ArcMap
Perform basic cartographic functions (changing the legend style, colors, etc.)
Query and edit a table (we will work on this more, but you should have a general concept of this)