**Geography 356 Syllabus**

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Text:


It will be indispensable, especially if you plan on a career in GIS. It's available at the local bookstores and at Amazon. Other readings will be placed on reserve in the IGIS lab or will be available over the web.

**Introduction**

Geo-referenced data is of growing importance for a wide range of disciplines and applications. The availability of ever-increasing volumes of digital geo-referenced data along with increasingly sophisticated desktop mapping/GIS tools for manipulation, analysis, and display of that information is facilitating the incorporation of "space" into both science and policy decision-making in a variety of contexts (e.g., environmental assessment, urban planning, studies of global climate change, mineral exploration, social/demographic analysis of health and health services, forestry, banking and insurance, location analysis, to name just a few).  

There is a demand in industry, government, and academic institutions for specialists knowledgeable in concepts and methods for spatial data manipulation, analysis, and display. Beyond this demand for specialists, those whose careers deal with geo-referenced data in any form are now routinely faced with a need to understand the characteristics of spatial data and how to make effective use of them. In either case, for the future geo-information specialist or the practitioner who will use geo-information, it is essential to develop a basic understanding of geo-referenced data characteristics (how they are collected, organized, transformed, etc.), of fundamental spatial data manipulation methods (data classification, interpolation, overlay analysis, buffering, etc.), of the conceptual basis for those methods, of geo-information system interface design, and of the special programming tools that have been developed to deal with spatial data in a flexible way. The goal of this course is to provide a solid foundation in each of these areas. You will, of course, not become a geo-information expert in one course, but should finish the course well on your way to that expertise.

**Course Specifics**

This course provides an introduction to geo-information and its representation with particular emphasis on computer programming methods and strategies applicable to geo-
referenced data. The course provides a bridge between geographic information systems and digital/analytical cartography (both covered in more depth in subsequent courses). From GIS we will consider various aspects of spatial data structures, data query strategies, and spatial operations on data sets. From cartography we will consider fundamentals of visual display of spatial data, spatial and aspatial manipulation of those data to support visual display, and principles of interface design for geo-information technology.

Lectures on Tuesday will focus on concepts and their potential application, while Thursday lectures and laboratory sessions will be devoted to methods for implementing the concepts using specific software tools. Laboratory assignments will focus on using and customizing ArcView as a spatial query and mapping tool, and on creating Avenue Scripts (ArcView's object-oriented scripting language) to manipulate and map spatial data. The majority of work on assigned projects will have to be done outside of scheduled class hours. Assignments will be distributed and collected electronically and you'll be expected to have an e-mail account and check it daily for course updates, helpful hints, etc.

Evaluation

Evaluation will be based on:
* performance on two exams (worth 90 and 110 points, respectively),
* participation in class (50 points),
* a series of laboratory projects (150 points)
* a final project, designed by teams of 2-3 students (100 points).

The exams will be comprehensive and cumulative. There will be no written final exam, because I am a nice guy.

You will be responsible for reading assignments throughout the semester and class participation is not only encouraged but has a significant effect on your course grade. During November, after the final projects have been assigned, lectures will be replaced with discussions of recent research articles in geo-information for which you will be expected to provide not only insightful commentary but a list of questions for discussion. More details later.

Lab projects will consist of a combination of labs done on paper and in digital format. Digital files (like ArcView projects) are to be turned into your directory in a secure "turn-in" directory on the IGIS network. Logistics of doing so will be detailed in the first lab. Labs (digital and paper) are due at the start of the class or lab meeting the day they are due. A 5% penalty per day late (starting the day it's due, not counting weekends) will be assessed up to 50% of the total grade for the lab (this is to encourage you to go ahead and do the labs even if you're a couple of weeks behind).

The final course project will be a group project that involves creating a small geo-information application in ArcView that builds upon concepts and methods covered in lecture and lab during the term. The application will be designed to perform some specific set of geo-information access, manipulation, analysis, and representation tasks and to be used by analysts who do not know ArcView. Particular emphasis will be on design of an effective user interface that makes it possible for a novice ArcView user to
generate maps, manipulate various attributes of the data processing behind those maps, and interact with the map display. Detailed documentation of the application will be required, and an interactive user's guide will be prepared that explains concepts behind the application and how to use it. There will be ten project groups, each consisting of 2-3 students. Each group member will be responsible for at least one 'programming' module within the overall package.

There will be several intermediate deadlines to be met prior to the final deadline. Meeting these intermediate deadlines is required for full credit on the final project. The final project itself will be due by 5pm Friday, Dec. 8. Each group will present its project during a 15-minute PROJECT DEMONSTRATION for the class during the last week of class time (Dec. 4-8). A 10% per day late penalty will be assessed for not meeting this final deadline.

**Readings:**

Readings will be announced in class. All readings will be available for brief checkout (long enough to photocopy - there is a photocopier in the basement of Walker) from IGIS. The IGIS copies are not to leave Walker, however, as many as possible will be available on the web. You need to be ready to discuss information contained within the readings both in class and on exams.