Course Syllabus

Hilbert College

Department of Law, Government, and Planning

Political Science 292
Introduction to Geographic Information Systems (GIS) in the Social Sciences
Fall 2006
Dr. Christopher Holoman

Course Description

This course introduces and explores the fundamental concepts of Geographic Information Systems (GIS), a tool for analyzing data using computer mapping. It explains the structure and function of GISs, and shows why GIS is important. It covers basic GIS concepts such as map characteristics and projections, spatial data models, relational databases, and spatial analysis. But most importantly, it places these skills within a context of urban planning and social justice. Hands-on experience with ArcInfo is provided through a series of exercises completed by students on their own computer or in the GIS lab. Prerequisites: MIS 120 or equivalent skills: students must be comfortable navigating through the Windows directory structure.

Course objective:

To gain a basic, practical understanding of GIS concepts, technical issues, and applications using ArcView GIS

By completing this course, students will:

- Gain a basic, practical understanding of GIS concepts, technical issues, and applications.
- Learn where GIS fits in the world of Information Systems and maps, how it is unique and why it is important.
- Understand the technical language of GIS.
- Understand how GIS is used as one tool of spatial analysis, especially with reference to the Social Sciences
- Gain practical experience using ArcInfo, a powerful and popular desktop GIS package.

Intended audience:

This course is designed for newcomers to the field of GIS who want to understand the concepts and technology and begin to be able to use it. It is particularly aimed at students in the Social Sciences/

Prerequisites:

MIS 120 or equivalent computer skills are required: students must be able to navigate through a Windows environment to locate data and have basic familiarity with Excel tables. Some exposure to Geography (GEO 288/289) is helpful, but not required.

Course format:

This class will combine classroom lecture, discussion and demonstration of geographic information systems, and computer presentations.

Students perform practical ArcInfo exercises on their own computer or in the lab using the data and software bundled with the texts.

Texts: (all have been ordered through the Hilbert bookstore, but quantities of "suggested" books are not guaranteed.)

Required: Think Globally, Act Regionally**,** by Richard LeGates

Getting Started with Geographic Information Systems by Keith C. Clarke.

Suggested: Getting Started with ArcGIS Desktop:, by Robert Burke, et. al. This boolk has exercises similar to the LeGates book, but with different emphases.

Spatially Integrated Social Science, Goodchild and Janelle, eds. This book lays out recent developments in the field. It is an advanced, scholarly book. We will be discussing some of the articles in class.

Class schedule:

Weeks 1 and 2 - Introduction and Overview of Geographic Information Systems

Definition of a GIS, features and functions; why GIS is important; how GIS is applied; GIS as an Information System; GIS and cartography; contributing and allied disciplines; GIS data feeds; historical development of GIS.

Week 3 - GIS and Maps, Map Projections and Coordinate Systems

Maps and their characteristics (selection, abstraction, scale, etc.); automated cartography versus GIS; map projections; coordinate systems; precision and error.

Weeks 4 -8: Spatial Data Models and using ArcInfo

Concept of data model; raster and vector data, how to manipulate layers, etc.

Weeks 9-11 - Data Sources, Data Input and Data Quality

Where can we get data? How do we evaluate data quality? Accessing and using Census data.

Weeks 12 and 13 - Spatial Analysis

How can we use our new skills to answer important questions in our fields? What does it mean to "think spatially?"

Weeks 14 and 15: Making Maps

Creating reports, etc. How do we present what we have found? How can we help consumers understand our findings? Basics of cartographic design.