

WILLIAM RAINEY HARPER COLLEGE
BUSINESS AND SOCIAL SCIENCE DIVISION
GENERAL COURSE OUTLINE

GEG Course Prefix	151 Course Number	Geographic Information Systems I Course Title	(2 - 2) Lec-Lab	3 Credit Hours
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COURSE DESCRIPTION

Introduces the theory and problem solving capabilities of Geographic Information Systems (GIS). Examines underlying fundamental concepts of cartography including the concepts of map projection, the Cartesian coordinate system, spatial data collection and data generalization. Students will acquire spatial data in the field and from published sources, and will learn the basic functions of GIS software and creating GIS databases and maps.

TOPICAL OUTLINE

- I. Introduction to GIS
 - A. Map types
 - B. GIS overview
 - C. Cartographic Processes
 - D. ArcGIS Overview
- II. Introduction to Basic Geographic Concepts
 - A. Coordinate Systems
 - B. Projection types, coordinates, datums
 - C. Scale limitations
 - D. Scale used in mapping
- III. Map Design and Layouts
 - A. ArcGIS Layout interface overview
 - B. Symbology interface and map classifications
 - C. What is where and patterns
 - D. Representation of discrete objects
 - E. Representation of continuous objects
- IV. Data Sources and Data Entry
 - A. Attribute table mechanics, joins and relates
 - B. Editing in ArcGIS
 - C. Raster and Vector formats and approach
 - D. Data table manipulation
 - E. Nominal, ordinal, interval, ratio data scales
 - F. Shape file mechanics and attribute formats
 - G. Concepts in Topology
- V. Modeling and Statistical Overview
 - A. What is modeling in GIS
 - B. Network data model
 - C. Model builder and networks
 - D. Geoprocessing tools commonly used
 - E. Data analysis overview
- VI. Base Map Information
 - A. Aerial Photos/GPS Overview
 - B. What is a base map and its importance
 - C. Parcels, utilities, and other data
- VII. GIS in the Workplace
 - A. How it applies
 - B. Politics and applications
 - C. Emergency Operations Center overview

VIII. Data Quality and Standards

- A. Metadata, accuracy, and generalization
- B. Data acquisition and financial budget considerations
- C. Data protection in the work environment
- D. Back up procedures
- E. Security and agreements in GIS

METHODS OF PRESENTATION

1. Lecture
2. Hands-on laboratory use of ArcGIS software
3. Discussion
4. Homework labs

STUDENT OUTCOMES: (The student should...)

1. work with the ArcGIS editing interface.
2. understand project creation steps in the GIS industry.
3. manipulate attribute tables for symbology and other analysis techniques.
4. understand the purpose of map projections and coordinate systems.
5. understand purpose behind vector and raster models.
6. learn to use the Layout interface for map construction.
7. work with an editing project based off a schematic.
8. understand the integration of ArcGIS, license levels and the extensions.
9. identify problems and standards with accuracy of data.
10. understand the concepts of geocoding and geoprocessing tools.

METHODS OF EVALUATION

Grades are based on demonstrated proficiency in subject matter. Proficiency is determined from:

1. Completion of laboratory exercises
2. Passing exams
3. Completion of various homework assignments

TEXTBOOKS

Chang, Kang-Tsung. Introduction to Geographic Information Systems. New York: McGraw-Hill Press, 2009.

Supplies: USB Flash Drive

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