

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

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

COURSE DESCRIPTION

Introduces the concepts and problem solving capabilities of Geographic Information Systems (GIS). Spatial data sourcing and management will be learned using information acquired in the field or from other sources. Spatial analysis concepts will be introduced through hands-on exercises with GIS software.

Prerequisite: GEG 150 with a grade of "C" or better.

TOPICAL OUTLINE

I. GIS Overview

- A. History and applications
- B. Geographic Information Science fundamentals
- C. GIS in the workplace

II. Data Quality and Standards

- A. Metadata
- B. Data needs analysis
- C. GIS data standards
- D. Data backup procedures

III. Data Formats and Sources

- A. Legacy and current GIS data formats
- B. Geodatabases
- C. Image formats
- D. Public sources of GIS data
- E. Data import/export and conversion
- F. Deriving new data (Contours etc.)
- G. Connecting to external data sources
- H. Data organization and name conventions

IV. Data Management

- A. Coordinate transformations
- B. Creating, editing, and deleting GIS data
- C. Topology (resolve, create, and build)
- D. Ground truthing
- E. Georeferencing

V. Spatial Analysis Introduction

- A. Geographic inquiry process
- B. Categorizing geographic information
- C. Data classification schemes
- D. Geoprocessing tools
- E. Buffer, overlay, and proximity analysis overview
- F. Network analysis overview

METHODS OF PRESENTATION

1. Lecture
2. Cooperative learning
3. Discussion
4. Hands-on lab exercises

STUDENT OUTCOMES: *(The student should...)*

1. describe the fundamental concepts of Geographic Information Science and GIS technology.
2. understand data quality concepts, issues, and workflows.
3. manage and source GIS data in a variety of digital formats.
4. demonstrate proficiency in creating, editing, transforming, and presenting GIS data.
5. understand the geographic inquiry process as a problem solving methodology.
6. demonstrate an understanding of fundamental spatial analysis concepts and techniques.
7. present the results of geographic analysis in different reporting formats.

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

TEXTBOOK & INSTRUCTIONAL MATERIALS

Longley et al., *Geographic Information Systems and Science*, 3rd ed., Wiley, 2010
Gorr and Kurland, *GIS Tutorial 1: Basic Workbook*, 4th ed., ESRI Press, 2010

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