

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

GEG	150	<b>Introduction to Geospatial Technologies</b>	(2-2)	3
Course Prefix	Course Number	Course Title	(Lec-Lab)	Semester Hours

### **Course Description**

Provides an introduction to geospatial technologies, such as Geographic Information Systems (GIS), Global Positioning Systems (GPS), and Remote Sensing through hands-on computer based exercises. The essential principles of map use and design, and spatial analysis are also included in this course. Fundamental desktop computer skills assumed. IAI S4 905

### **Topical Outline**

- I. Introduction to Geospatial Technologies
  - A. History and contemporary uses
  - B. Visualization and analysis tools
  - C. Careers
- II. Geographic Concepts
  - A. Datums, coordinate systems, projection types
  - B. Scale in GIS
  - C. Geographic representation
  - D. Spatial pattern recognition
  - E. Geographic inquiry process
- III. Map Design and Analysis
  - A. Map types, uses, and interpretation
  - B. Cartographic design principles
  - C. Thematic maps of physical or human geography
  - D. Interactive web maps
- IV. Survey of Global Navigation Satellite Systems (GNSS)
  - A. History of GNSS
  - B. GNSS components
  - C. Mission planning considerations
  - D. GNSS systems around the world
- V. GIS Fundamentals
  - A. GIS software functionality
  - B. GIS data types
  - C. Spatial distribution and patterns
  - D. Introduction to spatial databases
  - E. Viewing and selecting data
  - F. Georeferencing

- G. Geocoding
- H. Introduction to spatial analysis
- VI. Remote Sensing Overview
  - A. Aerial photograph interpretation
  - B. Remote sensing overview
  - C. Public sources of remote sensing data

### **Method of Presentation**

1. Lecture
2. Class Discussion
3. Other: Cooperative learning, Hands-on lab exercises

### **Student Outcomes (The student should)**

1. differentiate between and describe GIS, GPS and remote sensing technologies.
2. understand the purpose of map projections, map scale, and coordinate systems.
3. differentiate between the representation of discrete and non-discrete phenomena in GIS systems.
4. demonstrate proficiency in the basic functions of geospatial software and hardware.
5. apply cartographic principles in designing and constructing maps for different purposes.
6. demonstrate and understanding of GNSS systems and mission planning considerations.
7. understand GIS data types and the basic structure of spatial databases.
8. apply GIS techniques, such as geocoding and georeferencing to data sets.
9. understand the basic concepts of spatial analysis, such as, recognizing spatial patterns in the cultural and/or physical world, extracting data using queries, and foundational overlay techniques.
10. demonstrate awareness of fundamental remote sensing concepts.

### **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**

*Required*

Shellito. Introduction to Geospatial Technologies. 3rd Edition. W. H. Freeman, 2016 ISBN: 9781464188725

Gorr and Kurland. GIS Tutorial 1: Basic Workbook. 10.3x Edition. ESRI Press, 2016 ISBN: 9781589484566

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