

METROPOLITAN STATE COLLEGE OF DENVER  
Office of Academic Affairs

**REGULAR COURSE SYLLABUS**

**School of** Letters, Arts & Sciences

**Department:** Earth and Atmospheric Science

**Semester(s) Offered:** \_ Fall, Spring, Summer

**Prefix & Course Number:** GIS2250                      **Crosslisted With\*:** N/A

**Course Title:** Introduction to GIS

**Credit Hours:** 3 (2+2)

**Contact Hours:** Lecture 30 Lab 30 Internship \_\_\_\_\_ Practicum \_\_\_\_\_

**Schedule Type(s):** B **Grading Mode(s):** L

**Repeat\*** (Variable topics): N/A

\*(Pertinent only if the course can be repeated; enter maximum number of hours that can be earned by taking this course.)

**Restrictions (Variable Topics Course):** N/A

**Prerequisite(s):**

CSI 1010 or CMS 1010

MTH 1210 recommended

C or better in prerequisite courses

Or permission of instructor

**Corequisite(s):** none

**Prerequisite(s) or Corequisite(s):** GEG 1220

**Catalog Course Description:**

This is a foundation course that provides students with the basic knowledge of Geographic Information Systems (GIS) with regard to theoretical, technical, and application issues. It introduces and provides direct experience with the techniques used to analyze and display spatial data using GIS. The skills and knowledge developed in this course will be used to support upper -division courses.

**Required Reading and Other Materials will be equivalent to (Title, Author, Publisher, Copyright Date):**

Concepts and Techniques of Geographic Information Systems, 2nd Edition, C.P. Lo and Albert K. W. Yeung, Prentice Hall, NJ, 2007

APPROVED:

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Department Chair/Institute Director

Date

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Date

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Associate VP, Academic Affairs

Date

\*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: GIS2250  
Getting to Know ArcGIS, 2nd Edition Environmental Systems Research Institute.  
Redlands, CA. 2004

**Specific (Measurable) Student Behavioral Learning Objectives:**

Upon completion of this course the student should be able to:

1. Select the appropriate projection for a mapping application
2. Discuss the practical and theoretical differences between raster and vector data models
3. Determine raster and vector data requirements and sampling strategies
4. Perform raster analysis using raster operations
5. Perform vector analysis using vector operations
6. Produce cartographic products with required map elements
7. Assess data quality
8. Document procedures, methods, results, and conclusions of geographic investigation
9. Operate of the latest version of GIS software (ArcView GIS, or current equivalent)
10. Determine the usefulness of GIS to various academic disciplines
11. Solve simple spatial problems in land use and/or natural resources using GIS

**Detailed Outline Of Course Content (Major Topics and Subtopics) or Outline Of Field Experience/Internship (experience, responsibilities and supervision):**

1. Introduction.

- What is a GIS?
- Brief history of GIS.
- Where to find more information about GIS
- Data acquisition, processing, and analysis functions
- Interdisciplinary nature of GIS
- Current state of the art and market for GIS.
- Trends in GIS.

2. Map projections and processes

- Mapping processes
- Map projection definitions and selection
- Map scale representation

3. The raster and vector formats for GIS data.

- The raster data model.
- The vector data model
- Advantages and disadvantages of each data model.
- Appropriate use of raster and vector models to represent reality

4. Data acquisition.

- Sampling reality
- Digitizing and scanning: Advantages, disadvantages, when to use either one.
- Data entry.
- Sources of digital data.
- Data Formats
- Remote Sensing

5. Raster analysis Functions

- Describing attributes.
- Statistical analysis.
- Spatial description.
- Spatial analysis.
- Example analysis using a raster GIS.

6. Vector Analysis functions

- The vector GIS analytical capabilities.
- Describing attributes.
- Statistical analysis.
- Spatial description.
- Spatial analysis.
- Example analysis using a vector GIS.

7. Elements of Cartography

- Creating map output products with a GIS.
- Types of maps
- Map design elements

8. GIS application areas.

- GIS as a planning and decision support tool.
- Natural resources management.
- Urban planning and management.
- Cadastral records and LIS.
- Facilities management.
- Demographic and network applications.

9. Data quality and data standards

- Sources of mapping errors
- Metadata
- Data standards
- Map product standards
- Industry standards

**Evaluation Of Student Performance:**

- Labs, assignments, and quizzes
- Lecture Exams
- Class participation