

**GIS 40 Course Outline as of Fall 2015****CATALOG INFORMATION**

Dept and Nbr: GIS 40 Title: INTRO TO GIS  
 Full Title: Introduction to Geographic Information Systems (GIS)  
 Last Reviewed: 2/9/2015

| Units   |      | Course Hours per Week |      | Nbr of Weeks | Course Hours Total |       |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 3.00 | Lecture Scheduled     | 2.00 | 17.5         | Lecture Scheduled  | 35.00 |
| Minimum | 3.00 | Lab Scheduled         | 3.00 | 8            | Lab Scheduled      | 52.50 |
|         |      | Contact DHR           | 0    |              | Contact DHR        | 0     |
|         |      | Contact Total         | 5.00 |              | Contact Total      | 87.50 |
|         |      | Non-contact DHR       | 0    |              | Non-contact DHR    | 0     |

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable  
 Grading: Grade Only  
 Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP  
 Also Listed As:  
 Formerly: GIS 50

**Catalog Description:**

The course introduces students to fundamental concepts of geographic information systems (GIS). Topics include elements of GIS, data structures and their management, introductory input and output functions and mapping possibilities. Hands-on exposure to GIS technology through the use of computers and current industry standard software is provided during the laboratory. A working knowledge of the Windows O.S. and Microsoft Office is recommended.

**Prerequisites/Corequisites:****Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: The course introduces students to fundamental concepts of geographic information systems (GIS). Topics include elements of GIS, data structures and their management, introductory input and output functions and mapping possibilities. Hands-on exposure to GIS technology through the use of computers and current industry standard software is provided

during the laboratory. A working knowledge of the Windows O.S. and Microsoft Office is recommended. (Grade Only)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

|                   |                      |            |           |
|-------------------|----------------------|------------|-----------|
| <b>AS Degree:</b> | <b>Area</b>          | Effective: | Inactive: |
| <b>CSU GE:</b>    | <b>Transfer Area</b> | Effective: | Inactive: |

|               |                      |            |           |
|---------------|----------------------|------------|-----------|
| <b>IGETC:</b> | <b>Transfer Area</b> | Effective: | Inactive: |
|---------------|----------------------|------------|-----------|

|                      |              |            |             |           |
|----------------------|--------------|------------|-------------|-----------|
| <b>CSU Transfer:</b> | Transferable | Effective: | Spring 2009 | Inactive: |
|----------------------|--------------|------------|-------------|-----------|

|                     |              |            |           |           |
|---------------------|--------------|------------|-----------|-----------|
| <b>UC Transfer:</b> | Transferable | Effective: | Fall 2009 | Inactive: |
|---------------------|--------------|------------|-----------|-----------|

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

**Student Learning Outcomes:**

Upon completion of the course, students will be able to:

1. Define the elements of a geographic information system (GIS)
2. Describe the applications of GIS for different disciplines
3. Create a GIS using image, geographic and database information

**Objectives:**

Upon completion of this course, the student will be able to:

1. List the primary functions of a GIS.
2. Understand elementary spatial analysis of data.
3. Define image, geographic and database methods of representing data.
4. Describe the differences between CAD and GIS.
5. Use different types of graphic symbols.
6. List and identify different file structures and their advantages and disadvantages.
7. Describe data storage, editing and retrieval techniques used in a GIS.
8. Create a GIS using image, geographic and database information.

**Topics and Scope:**

Lectures will cover the following topics:

- 1) Introduction to GIS
  - a) the purpose and scope of a GIS
  - b) GIS data sources: image, geographic and database information
  - c) GIS terminology
2. Spatial Analysis

- a) spatial awareness
  - b) spatial elements
  - c) geographic data collection
  - d) population and sampling schemes
  - e) making inferences from data
3. Maps as a Model of Geographic Data
- a) map as a model
  - b) map scale and characteristics
  - c) map projections
  - d) thematic maps
  - e) cartographic process
4. Cartographic and GIS Data Structures
- a) terms
  - b) computer file structures
  - c) computer database structures for managing data
  - d) graphic representation of entities and attributes
  - e) GIS data models for multiple coverages
5. GIS Data Input
- a) input subsystems
  - b) methods of input
  - c) external databases
6. Data Storage and Editing
- a) storage of GIS Database
  - b) simple analysis framework
  - c) detecting and editing changes
  - d) dealing with projection changes
  - e) joining adjacent coverages
7. Elementary Spatial Analysis
- a) terms
  - b) simple analysis framework
  - c) defining objects based on their attributes
  - d) working with higher level objects
  - e) sample applications of these concepts
8. Spatial Arrangement
- a) point, area, and line arrangement
  - b) point patterns
  - c) linear patterns
  - d) routing and allocation
  - e) sample applications
9. GIS Design
- a) the need for GIS design
  - b) the software engineering approach
  - c) structured design model
  - d) formal GIS design methodology
  - e) verification and validation
10. GIS Output
- a) applications in different disciplines
  - b) cartographic output
  - c) map design controls
  - d) nontraditional cartographic output
  - e) non-cartographic output
  - f) technology and GIS output

## Assignment:

1. Textbook reading (1-2 chapters/week)
2. Weekly lab assignments
3. GIS mapping project
4. Midterms (2)
5. Final exam

## Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Weekly lab assignments

Problem solving  
30 - 50%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

GIS mapping project

Skill Demonstrations  
30 - 50%

**Exams:** All forms of formal testing, other than skill performance exams.

Two mid-terms, final exam: multiple choice, completion, true-false, short answer

Exams  
20 - 30%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None

Other Category  
0 - 0%

## Representative Textbooks and Materials:

Fundamentals of Geographic Information Systems, John Wiley & Sons, Inc., NY. DeMers M.N. (2008 classic)

GIS Fundamentals, P. Bolstad; Eider Press, 4th edition, 2012

Introductory Geographic Information "Systems, Jensen and Jensen; Prentice Hall, 2012

Instructor prepared materials