

**GIS 51 Course Outline as of Fall 2021****CATALOG INFORMATION**

Dept and Nbr: GIS 51                      Title: INTERMEDIATE GIS  
 Full Title: Intermediate Geographic Information Systems (GIS)  
 Last Reviewed: 1/23/2023

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:

**Catalog Description:**

This is an intermediate level course in the concepts of Geographic Information Systems (GIS). Topics include elements of GIS, data structures and their management, intermediate 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.

**Prerequisites/Corequisites:**

Course Completion of GIS 40 and APTECH 191

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: This is an intermediate level course in the concepts of Geographic Information Systems (GIS). Topics include elements of GIS, data structures and their management, intermediate 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. (Grade Only)

Prerequisites/Corequisites: Course Completion of GIS 40 and APTECH 191

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

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>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

**Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Create, edit and analyze geographic data
2. Prepare reports, charts and layouts
3. Describe and implement the steps necessary to answer a geographic question
4. Produce an output of finished quality maps representing a basic analysis, a basic survey or a basic scale-based, descriptive, diagrammatic summary

**Objectives:**

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

1. Demonstrate an understanding of the structure and organization of the software package
2. Create a map project using GIS software
3. Define and apply the relationship of geographic features and attribute data
4. Perform feature identification and classification
5. Perform query and analysis functions
6. Define and edit spatial relationships
7. Create a map layout
8. Integrate GIS with other software and technology
9. Utilize basic cartographic principles in map design and construction

**Topics and Scope:**

Lectures will cover the following topics:

1. Identify source files
  - a. Links to files
  - b. How to change files in the project
2. Perform geocoding for geographic location

3. Perform selection by location for data analysis
4. Perform spatial joins of database information
5. Overlay analysis by:
  - a. Proximity
  - b. Spatial data processing
  - c. Clip data demonstration
  - d. Dissolve data demonstration
  - e. Append to data demonstration
  - f. Demonstrate the union function
6. Utilize GIS software features
  - a. Create metadata
  - b. Utilize Arc Toolbox features
7. Produce map layouts
  - a. Create reports
  - b. Create graphs
8. Create and edit geodatabases
9. Create and edit data sources
  - a. Import and edit other data formats
  - b. Computer Assisted Drafting and Design (CADD)
  - c. Interchange files
  - d. Text and CSV files
  - e. MS Access files
10. Perform intermediate level analysis functions on data
  - a. Queries
  - b. Attribute joins
  - c. Spatial joins
  - d. Edit attributes
  - e. Create edit centroids
11. Perform intermediate level statistical analysis
12. Create summary tables: perform spatial adjustment & georeferencing
13. GIS design
  - a. Need for GIS design
  - b. The software engineering approach
  - c. Structured design model
  - d. Formal GIS design methodology
  - e. Verification and validation
14. GIS output
  - a. The display of analysis
  - b. Cartographic output
  - c. Map design controls
  - d. Nontraditional cartographic output
  - e. Non-cartographic output
  - f. Technology and GIS output

#### LABORATORY TOPICS & SCOPE:

ESRI Virtual campus and discussion

- A. Solving Spatial Problems
- B. Basics of Raster Data
- C. Deriving Terrain Rasters
- D. Raster Site Selection
- E. Distance Analysis
- F. Exploring Spatial Patterns

G. Introduction to Surface Models  
H. 3D Visualization Techniques

**Assignment:**

1. Textbook reading (1-3 chapters per week)
2. Essay writing assignments (3-5)
3. Lab assignments (6-12)
4. Midterms (1-3)
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.

Short essays

Writing  
10 - 20%

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

Lab assignments

Problem solving  
40 - 50%

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

None

Skill Demonstrations  
0 - 0%

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

Midterm and final exams: Multiple choice, completion, true-false, short answer

Exams  
40 - 50%

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

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

GIS Fundamentals, A First Text on Geographic Information Systems (5th). Bolstad, Paul. Eider Press: 2016

Lining Up Data in ArcGIS: A Guide to Map Projections (2nd). Maher, Margaret. ESRI Press: 2013

Modeling Our World: the ESRI Guide to Geodatabase Concepts, 2nd Edition Michael Zeiler. ESRI Press: 2010