

GEOG 0091A - BEGINNING GEOSPATIAL DESIGN

Catalog Description

Hours: 18 lecture

Description: Introduction to Geographic Information Systems (GIS) cartographic and database design. Emphasis on GIS and mapping design for practical applications in the fields of natural resource management, disaster mapping, urban planning, business and other related fields. GIS skills include organizing geographic features and attributes, classifying data, labeling, symbology, and proper layout to create maps for GIS analysis. (CSU)

Course Student Learning Outcomes

- CSLO #1: Demonstrate ability to add data to ArcMap with layers lined up correctly and accurately with synchronized projections.
- CSLO #2: Label geographic features on map with software using standard cartographic principles.
- CSLO #3: Draw and edit geographic features.
- CSLO #4: Create and edit databases (with domains, fields, etc.) including creating Arc GIS Geodatabases.
- CSLO #5: Perform queries on attribute tables.
- CSLO #6: Perform spatial queries on map layers.

Effective Term

Fall 2021

Course Type

Credit - Degree-applicable

Contact Hours

18

Outside of Class Hours

36

Total Student Learning Hours

54

Course Objectives

1. Discuss map characteristics and effective map design.
2. Describe basic GIS components as a spatial database.
3. Define coordinate projection & datum systems.
4. Find map input options and understand spatial data formats.
5. Apply software features that catalog data and reveal metadata.
6. Build basic skills to add map layers & geographic features; open attribute tables.
7. Classify features and rasters.
8. Create maps with focus on concise symbology & labels; dynamic scale.
9. Elaborate on map output options and navigate layout tools.
10. Query and manipulate data to create alterations of a basic map.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Classroom Discussions
 - Example: Students use existing data on the election results containing demographic data. They then organize data to show various aspects of the population, let's say educational attainment and party preference. Student discuss how to create various narratives, for example displaying only state-wide maps versus county-wide data for a state.
- Problem Solving Examinations
 - Example: Using GIS data outside of workbook, all students will be graded on their ability to perform similar functions as workbook exercises, such as queries or classifying data to create a logical map (e.g. choropleth map that accurately represents the election results by area).
- Projects
 - Example: Students will complete an individual project at the end of the class demonstrating the simple objectives they have learned in class.
- Skill Demonstrations
 - Example: Students add map layers, open attribute tables, select various attributes and designated values to create various map layouts. Example: Students given data on the campus trail system, with roads (with various values like gravel, dirt, paved, wide, narrow, etc.), single track trails, stray trails, etc. Instructor ask students to classify and symbolize a GIS map with different symbology for different feature classes and different attributes, such as roads and trails, and those roads that are paved and those that are dirt (different symbology).

Repeatable

No

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Instructor presents fundamental concepts of GIS design, such as correct and common color choices, in lecture format using visual aids followed by student discussion supplemented from assigned reading. Instructor leads students to outline basic GIS design processes (including manipulating data to display what is intended, such as urban areas and rivers.)
2. After instructor lecture on GIS design related to use of labels, thresholds, color choice, students will see how this works with GIS software (e.g. Esri ArcPro) using data provided by instructor after experimenting with what works visually; discussion and activity on what works well and what does not work well, for example with color

choice (even thinking about color blind people). Likewise, students need to experiment with Choropleth maps and how to sort data.

Distance Learning

1. Instructor demonstrates how to add data, such as thematic layers like roads and rivers, using the industry standard online GIS software (ArcGIS). The instructor creates lectures to explain how layers (roads, rivers, etc.) line up or stack on top of one another in geographic space. Additional step may need to be taken with processing tools to georeferenced layers, which the instructor demonstrates. The lecture be delivered through a slide lecture presentation on a LMS platform. Student will complete query exercises from workbook and upload the completed assignment into LMS.

Typical Out of Class Assignments

Reading Assignments

1. Read chapter on Introducing GIS and outline major components of a GIS. Investigate other case studies that solve spatial problems using a GIS. Be prepared to discuss in class.
2. Read textbook or workbook regarding "File Geodatabases" and how they related to data displayed in the map layers and used in the GIS analysis and be prepared to discuss in class.

Writing, Problem Solving or Performance

1. Distinguish between categorical and quantitative data, and symbolize appropriately with dialogue box and histograms - used to create a logical choropleth map.
2. Properly label and symbolize a map layout based on some key elements such as "readability" and scale (zooming in and out).

Other (Term projects, research papers, portfolios, etc.)

1. Create a single map as a "final" class project.

Required Materials

- GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook
 - Author: Wilpen Gorr
 - Publisher: ESRI Press
 - Publication Date: 2017
 - Text Edition: 1st
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.