

SOUTHEAST COMMUNITY COLLEGE
ADVANCED TECHNOLOGIES AND SKILLED TRADES DIVISION
Land Surveying/GIS/Civil Engineering Technology Program
Revision Date: August 2025

I. CATALOG DESCRIPTION

Course Number: LSCE2547
Course Title: Applied GIS
Prerequisite(s): None
Catalog Description: This course covers the underlying geographic concepts (world coordinate system and projections, vector map topology, tiled and layered maps, etc.) map design and outputs, geodatabases, importing spatial and attribute data, digitizing, geocoding, spatial data processing, and advanced spatial analysis. Other topics such as raster integration, Internet-enabled GIS, network, and 3D analysis are also addressed. The technical focus of the course includes computer lab tutorials and case studies using the leading desktop GIS software, ArcGIS from ESRI. Application areas covered in this course include city and regional planning, community planning, economic development, and environmental studies, housing and property evaluation, transit and transportation issues, land use, historic studies, emergency management, public works utilities, census population and demographic studies, and business applications. By the end of this course, students will have sufficient background to identify spatial characteristics of diverse application areas, enabling them to integrate spatial thinking and GIS analysis into their research and careers.

Credit Hours: 3.0
Class Hours: 15
Lab Hours: 90
Total Contact Hours: 105

II. COURSE OBJECTIVES: *Course will:*

- A.** Give sufficient background to the students in order to identify spatial characteristics of diverse application area, enabling them to integrate spatial thinking and GIS analysis into their academic research and careers.
- B.** Learn to use GIS as a problem-solving tool from the first stages of designing an analysis project, through the data collection and manipulation phase, to the final phase of presenting the project.
- C.** Enable students to create geodatabases for projects, design the analytical processes, and perform these processes using the data by focusing on the roots of GIS – creating and manipulating data.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A.** Student Learning Outcomes: *Student will be able to:*
 - 1.** Work with map layers
 - 2.** Navigate in a map document
 - 3.** Work with feature attributes
 - 4.** Work with attribute tables
 - 5.** Create choropleth maps using custom attribute scales
 - 6.** Create a point feature map based on a definition query

7. Explore interactive GIS
8. Use ArcCatalog utilities
9. Work with map projections
10. Explore sources of raster maps
11. Use data queries to extract features
12. Create a TIN from contours
13. Explore ArcGlobe Web service
- B. General Education Learning Outcomes (GELOs)
 1. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE

- A. Introduction
- B. Map Design
- C. GIS Outputs
- D. File Geodatabases
- E. Spatial Data
- F. Digitizing (Case 1 assignment, poverty or transportation)
- G. Geocoding
- H. Geoprocessing
- I. Spatial Analysis
- J. ArcGIS 3D Analyst
- K. ArcGIS Spatial Analyst
- L. Mapping where things are
- M. Mapping the most and least
- N. Mapping density
- O. Finding what's inside
- P. Finding what's nearby
- Q. Mapping change
- R. Measuring geographic distribution
- S. Analyzing patterns
- T. Identifying clusters
- U. Designing a framework for the complex geodatabase
- V. Working with data
- W. Optimizing the workflow
- X. Using advanced techniques for labeling and symbolizing

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Gorr, Wilpen L. and Kurland, Kristen S., *GIS Tutorial 1: Basic Workbook for ArcGIS 10*, ESRI Press (Refer to CID and/or instructor for current edition)

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 1. Lectures
 2. Classroom demonstrations
 3. Classroom discussions
 4. Hands-on lab projects
 5. Lab demonstrations
 6. Lab assistance
 7. Instructional handouts
 8. PowerPoint presentations

VII. METHODS OF EVALUATION

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Assignments Sheets Lab
 - 2. Tests
 - 3. Participation

VIII. SPECIFIC COURSE REQUIREMENTS

- A. A minimum grade of “C” or higher is required in all courses designated or starting with LSCE to progress through or graduate from the program.