

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Geographic Information Systems (GIS) is used within the following economic sectors and organizations:

- Business (e.g. banking, logistics, real estate, marketing, and more),
- Government (e.g. local, state, national, military, emergency services, law enforcement, transportation, and more),
- Education and Science (e.g. research, libraries, k-12 education, higher education, and more),
- Environment and Conservation (e.g. ecology, parks, pollution monitoring, and more),
- Natural Resources (e.g. agriculture, forestry, mining, non-renewable resources, renewable resources, and more), and
- Utilities (e.g. electricity, natural gas, telecommunications, water, wastewater, and more).

Contact Information

Division: Science (PS - 148)

Division Phone Number: (909) 384-8645

Faculty Chairs: Todd Heibel (theibel@sbccd.edu), Ph.D. and Matthew Robles (mrobles@sbccd.edu), M.S.

Counselor Liaisons: Elizabeth Banuelos (ebanuelos@sbccd.edu), M.S. and Erica Begg (ebegg@sbccd.edu), M.S.

STEM Counselors: Daniele Smith-Morton (dasmith@sbccd.edu), Ed.D. and Abena Weber (awahab@sbccd.edu), Ed.D.

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- Geographic Information Systems Certificate of Achievement (<http://catalog.valleycollege.edu/degree-certificate-program-index/geographic-information-systems-gis/geographic-information-systems-certificate-achievement/>)

GIS 098 1-4 Units

GIS Work Experience

WRKEX: 300 contact hours

Prerequisite/Corequisite: GIS 135

This course involves supervised training, in the form of on the job employment that will enhance the student's knowledge in the selected field of study. The student's major and job must match. For paid work, 75 hours = 1 unit; for volunteer work, 60 hours = 1 unit. Students may earn a total of 16 units toward graduation in Work Experience 098 courses. See department for specific guidelines.

Associate Degree Applicable

GIS 100 3 Units

Map Interpretation and Geospatial Analysis

Lecture: 36 contact hours

Lab: 54 contact hours

Advisory: ECON 208 or MATH 108 or MATH 108H or PSYCH 105 and ENGL 101 or ENGL 101H

Have you ever wondered how the traffic map works on your phone? Do you enjoy exploring maps and satellite images online? This class is an introduction to maps, images and geospatial techniques and technologies. The technologies covered in this course include map and aerial photograph interpretation, tabular data, spatial statistics, cartography, Global Positioning Systems (GPS), automated and web-based mapping, remote sensing, and Geographic Information Systems (GIS), all of which aid in data collection, analysis and presentation. Theories, methods, and ethics within GIS, GPS, remote sensing, cartography, and field work play a central role in this course. This course also highlights how GIS and geospatial analytical tools can address longstanding issues related to economic, environmental, political, racial, and social justice. (This course is also offered as GEOG 100).

Associate Degree Applicable

Transfers to both UC/CSU

C-ID: GEOG 150

GIS 130 3 Units

Introduction to Geographic Information Systems (GIS)

Lecture: 36 contact hours

Lab: 54 contact hours

Advisory: ECON 208 or MATH 108 or MATH 108H or PSYCH 105 and ENGL 101 or ENGL 101H

How do corporations know where to locate retail stores and restaurants? How do epidemiologists know how to confront epidemics, pandemics, and related disease outbreaks? How does your utility provider know the location of power outages and water leaks? How do demographers create maps based on ethnicity, socioeconomic status, age, gender, religious affiliation, and other population characteristics? The answers to these questions and more are found within Geographic Information Systems (GIS). This course provides an introduction to the fundamentals of Geographic Information Systems (GIS), including the history of automated mapping. It includes a brief introduction to basic cartographic principles, including map scales, coordinate systems and map projections. GIS hardware and software are implemented, as are various applications of GIS technology used in environmental science, business and government. Using automatic mapping software like ArcGIS Online, ArcGIS Pro, ArcMap, and Story Maps, you will create maps that address a variety of local to global issues. (This course is also offered as GEOG 130)

Associate Degree Applicable

Transfers to both UC/CSU

C-ID: GEOG 155

GIS 133 3 Units**GIS Cartography and Base Map Development****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** GEOG 130 or GIS 130

We interact with maps all the time, in the news, on your mobile device, and elsewhere. Accurate, well produced maps are vital for public consumption. Maps are powerful tools in the spatial representation of historically marginalized and underrepresented groups. This course introduces the nature of cartography, standard cartographic conventions, and graphic symbology. Map projections, scale, types of thematic maps, and map accuracy are reviewed. Current industry standard techniques used in GIS base map development are employed, including production and presentation techniques of professional quality maps.

Associate Degree Applicable**Transfers to both UC/CSU****GIS 134 3 Units****Data Acquisition and Management****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** GEOG 130 or GIS 130

There are myriad methods to collect, administer, and display spatial data. Cloud computing, Artificial Intelligence (AI), social media, drone and satellite platforms, and traditional on the ground field work all contribute to GIS data. This course addresses the interpretation and understanding of a variety of data formats available in GIS. It introduces the fundamental concepts of primary GIS data creation, and discusses quantitative techniques for collection, classification, and management of geographical data.

Associate Degree Applicable**Transfers to CSU only****GIS 135 3 Units****Spatial Analysis with GIS****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** GEOG 130 or GIS 130

Cloud computing, artificial intelligence (AI), web GIS, and automated mapping are becoming increasingly important within spatial analysis. This course is an introduction to spatial analysis with fundamental concepts and analytical procedures used to simplify complex spatial modeling. Specific methods covered include spatial queries, buffering, overlay, interpolation, network analysis, surface analysis, and spatial autocorrelation. Spatial analysis tools and services have the capacity to highlight and address long-standing issues of economic, environmental, racial, and social justice, as well as environmental sustainability.

Associate Degree Applicable**Transfers to CSU only****GIS 137 3 Units****GIS Advanced Applications****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** GIS 135

This course provides hands-on training in advanced applications of GIS using ArcGIS Online, ArcGIS Pro, ArcGIS Developer, and ArcGIS Enterprise. It includes Application Programming Interface (API), Visual Basic Applications (VBA), JavaScript, and Python scripting for customizing ArcGIS. It includes an introduction to ArcGIS Server, Web Map Service (WMS), ArcGIS WebApp Builder, and building maps and models for publishing to the web. Students will build web applications with GIS capabilities using Application Service Provider (ASP) and application programming interface (API) tools.

Associate Degree Applicable**Transfers to CSU only****GIS 222 1-3 Units****Independent Study in Geographic Information Systems****DIR:** 54 contact hours**Prerequisite:** GEOG 130 or GIS 130

Students with previous course work in GIS may do assigned projects involving research and analysis of selected topics. This independent study is for students who are interested in furthering their knowledge of GIS. Prior to registration, a written contract must be prepared jointly by the instructor and the student.

Associate Degree Applicable**Transfers to CSU only**