

Geographic Information Systems

Certificate of Achievement

Certificate of achievement in Geographic Information Systems

A Geographic Information System (GIS) is a combination of hardware, software, data, people, and protocols, and is primarily used for the acquisition, maintenance, and analysis of geospatial data and information. GIS was founded in the art and science of geography, and more specifically was born from forestry and its associated applications (i.e., natural resources). Its main purpose is to serve as a tool for analyzing geospatial phenomena, via various data overlay operations, to provide information in the form of visualizations (i.e., maps), which ultimately provide greater insight into such phenomena from the perspective of geospatial patterns and real-world feature relationships. The end goal of a GIS is to provide meaningful analysis results to better understand real-world situations and help end-users of such information make better decisions regarding how best to handle geospatial phenomena.

As a GIS student you will:

Study the history of GIS, learn what it is and how it is used, and discover the foundational concepts that allow it to be a successful system

Develop skills in using hardware and software applications, in conjunction with relevant data and information, to learn how to approach and help solve potential real-world geospatial phenomena

Acquire critical thinking skills that will allow you to view and analyze geospatial patterns and feature relationships from a scientific perspective

Gain knowledge in the dissemination of geospatial information to web-based data and information delivery environments, as well as exposure to ancillary geospatial technologies such as Global Positioning Systems (GPS), Remote Sensing, and Computer-Aided Drafting (CAD) data and their respective applications

Career Options

GIS Technician for private entity or government agency

Supplemental GIS education to add to existing or future education in another field, which will help to strengthen overall knowledge from a technical standpoint

Program Highlights

Lassen Community College offers its Geographic Information Systems certificate as an entirely online program of study. No physical classroom involvement is required. Courses may be offered via traditional face-to-face or hybrid instructional modalities as well

The Geographic Information Systems certificate can be completed in just two semesters

The Geographic Information Systems certificate is well suited to provide individuals with the education necessary to enter the workforce as an entry-level GIS Technician, or add to an existing or future bachelor's degree education to help strengthen and solidify the technical nature of said degree. For example, a combination of a bachelor's degree in wildlife biology and a certificate in GIS can be a very valuable and powerful combination to potential employers

Certificate of Achievement Geographic Information Systems

Total Units for the Certificate of Achievement: 16

Course No	Course Title	Units			
GIS 1	Fundamentals of GIS	4.0	GIS 4	Spatial Analysis	3.0
GIS 2	GIS Data Concepts	3.0	GIS 5	Web/Mobile-based GIS	3.0
GIS 3	Cartography and Geovisualization	3.0			

Program Student Learning Outcomes

Upon completion of the **Certificate of Achievement in Geographical Information Systems** student will be able to:

1. Demonstrate an understanding of what a GIS is, how it can be used, and how the technology has come to be.
2. Explain, in detail, the nature of geospatial data and associated systems – types, formats, structures, models, acquisition, maintenance, manipulation, and display.
3. Apply critical thinking skills to the approach of establishing a basic GIS and using said GIS to analyze pertinent data and information to derive results that can or may help to better understand a perceived real-world geospatial phenomenon.
4. Use the latest, basic GIS-based software technologies on the market with effective and efficient application.
5. Be academically prepared to obtain an entry-level position directly in GIS, or to greatly supplement and enhance another chosen career field that can benefit from the technical nature of GIS knowledge.

GEOGRAPHICAL INFORMATION SYSTEMS COURSES

GIS 1 – Fundamentals of GIS

4 units

CSU/UC

Co-requisite: GIS 2 Data Concepts

This course covers theoretical and applied knowledge of Geographic Information Systems (GIS). Students will learn the basic history of GIS, as well as what it is, how it functions, and why it is used to benefit real-world, problem-solving applications. Geospatial data, and associated information, will be a core component of the course, including acquisition, development, maintenance, manipulation, analysis, and display of content. Spatial parameters (i.e., projections, coordinate systems, datum's, and units of measure), geodatabase structures and use, basic cartographic skills, and simple overlay analysis and geoprocessing techniques are covered as well. This course is offered in traditional, online, and hybrid modalities.

GIS 2 – Data Concepts

3 units

CSU/UC

Co-requisite: GIS 1 Fundamentals of GIS

This course covers concepts and techniques associated with geospatial data, including detailed examination of the design and implementation of geodatabases for Geographic Information Systems (GIS). Relational database management systems (RDBMS), and their functionality in relation to GIS, are a key concept in the course. Other concepts such as data integration, organization, and quality assurance; attribute information classification; feature digitization and editing; and geocoding will be covered as well. This course has been approved for online and hybrid delivery.

GIS 3 - Cartography and Geovisualization

3 units

CSU/UC

Prerequisite: GIS 1-Fundamentals of GIS & GIS 2- Data Concepts

This course covers advanced concepts associated with cartography and geovisualization, as they relate to Geographic Information Systems (GIS). Cartographic principles will be covered in-depth, including enhanced map layout design and corresponding map element styling. Students will work with complex hardcopy and digital map outputs, including web-based visuals. Animations, 3D scenes, Story Maps, and other forms of geovisualization techniques are examined as well. This course has been approved for online and hybrid delivery.

GIS 4 – Spatial Analysis

3 units

CSU/UC

Prerequisite: GIS 1-Fundamentals of GIS & GIS 2- Data Concepts

This course covers the advanced and specialized topic of spatial analysis, in relation to Geographic Information Systems (GIS). Spatial analysis examines the spatial relationships of features in geospatial data, such as patterns, trends, connections, etc. GIS-based spatial analysis techniques are covered extensively for both vector and raster data models. A heavy emphasis is placed on using spatial analysis operations to aid in geospatial problem-solving scenarios as well. Geospatial modelling is a key component of the course, also. This course has been approved for online and hybrid delivery.

GIS 5 - Web/Mobile Based GIS

3 units

CSU/UC

Prerequisite: GIS 1-Fundamentals of GIS & GIS 2- Data Concepts

This course covers concepts associated with web-based data and mapping applications, as well as mobile data collection methodology, as they relate to Geographic Information Systems (GIS). Latest trends in online GIS technology are examined, including Esri's ArcGIS Online interface and ancillary components. Web Maps, Story Maps, and Web AppBuilder for ArcGIS will be explored. On the mobile side, application technologies such as Collector for ArcGIS and Survey123 will be studied, also. Students will be exposed to a basic understanding of Global Positioning Systems (GPS), too. This course has been approved for online and hybrid delivery.