

Geography (GEOG)

Contact the Earth, Space, and Aviation Sciences Department for further information.

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Associate in Science Degree -

AS Degree requirements are listed in Section 6 (green pages).
• Advanced Geographic Information Systems

Certificates of Achievement -

Certificate of Achievement requirements are listed in Section 6 (green pages).
• Advanced Geographic Information Systems

Certificates of Proficiency -

Certificate of Proficiency requirements are listed in Section 6 (green pages).
• Geographic Information Systems

PROGRAM OF STUDY

Advanced Geographic Information Systems

The Advanced Geographic Information Systems (GIS) Certificate program at Palomar College is designed to provide students with the technical and theoretical knowledge needed to pursue a successful career in growing field of geospatial analysis. Through a combination of lectures, learning modules, case studies, internships, and projects, students will learn to manage, plan, and implement GIS projects.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
GEOG 120	Intro to Geographic Information Sys/GIS Software	4
GEOG 132	Database Management and Data Acquisition	4
GEOG 134	GIS Applications	2
GEOG 136	Intermediate ArcGIS: GIS Analysis	2
GEOG 138	GIS Internship	2
Specialized Concentration (Select 2 courses)		
GEOG 140	Introduction to Remote Sensing	1
GEOG 141	Transportation Systems Analysis	1
GEOG 142	Environmental Applications of GIS	1
GEOG 143	Introduction to Cartography and Computer Mapping	1
GEOG 150	Geographic Information Science and Spatial Reasoning	3
Electives (Select 1 course)		
CSIT 150	Introduction to SQL	3
CSWB 120	JavaScript	3
DT 110	Technical Drafting I with AutoCAD	4
TOTAL UNITS		19 - 22

PROGRAM OF STUDY

Geographic Information Systems

The Geographic Information Systems Certificate program is designed to provide entry-level training for students seeking employment in this fast-growing profession, or to upgrade the skills for those already working in the field of Geographic Information Systems. The program may be completed in one year including summer session.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
GEOG 120	Intro to Geographic Information Sys/GIS Software	4
GEOG 132	Database Management and Data Acquisition	4
GEOG 134	GIS Applications and Programming	2

GEOG 136	Intermediate ArcGIS: GIS Analysis	2
GEOG 138	GIS Internship	2
TOTAL UNITS		14

COURSE OFFERINGS

GEOG 100 Physical Geography (3)
3 hours lecture

Transfer acceptability: CSU; UC

A study of earth's physical environment with emphasis on weather, climate, landform, soils, and natural vegetation and the interrelationship between these elements within unique physical landscapes.

GEOG 100L Physical Geography Laboratory (1)
3 hours laboratory

Prerequisite: A minimum grade of 'C' in GEOG 100, or concurrent enrollment in GEOG 100

Transfer acceptability: CSU; UC

Laboratory and field investigations in weather elements, climate regions, soils, world ecosystems, and Earth's landform features. Satisfies laboratory requirement in physical sciences.

GEOG 103 World Regional Geography (3)
3 hours lecture

Transfer acceptability: CSU; UC

Critical survey of the major world regions with specific focus on physical and cultural components, such as development, economics, population and migration, political structure, and natural resources and the physical environment.

GEOG 105 Introduction to Human Geography (3)
3 hours lecture

Transfer acceptability: CSU; UC

Human elements of geography, including population distribution, general land use patterns, religion, trade and economy, and their correlation with the physical elements. Emphasis on world cultural regions with attention paid to interdependence and globalization.

GEOG 110 Meteorology: Weather and Climate (3)
3 hours lecture

Transfer acceptability: CSU; UC

Elements of weather including temperature, moisture, air pressure, and circulation of the atmosphere; air masses, storms, and their geographical distribution. Practical applications in the use of weather instruments, and the reading and interpretation of weather maps and climatological data.

GEOG 115 Natural Disasters and Environmental Hazards (3)
3 hours lecture

Note: Cross listed as ES 115

Transfer acceptability: CSU; UC

Examination and analysis of natural disasters and environmental hazards including earthquakes, tsunamis, volcanic activity, hurricanes, flooding, air and water pollution, and global climate change.

GEOG 120 Introduction to Geographic Information Systems and GIS Software (4)
3 hours lecture - 3 hours laboratory

Recommended preparation: GEOG 100 and CSIT 105

Transfer acceptability: CSU; UC

An introduction to the mapping sciences with a primary focus on Geographic Information Systems (GIS). Covers the trends, history, structure, application, hardware and software, and basic operations of GIS in order to provide a foundation for the use of GIS software. Related geographic technologies to be examined include mapping, aerial and satellite imagery, and Global Positioning Systems (GPS). The lab portion will provide introductory training in the use of ArcGIS software including identifying, evaluating, and inputting spatial data, developing and using raster and vector data sets, converting data from one form to another, and applying programming with GIS software.

- GEOG 125 California Geology and Geography** (3)
3 hours lecture
Note: Cross listed as GEOL 125
Transfer acceptability: CSU; UC
Emphasizes the physical geographic and geologic factors that have combined to form the varied landscapes of California. Climate and vegetation patterns, as well as the various geomorphic processes will be studied.
- GEOG 132 Database Management and Data Acquisition** (4)
4 hours lecture
Prerequisite: A minimum grade of 'C' in GEOG 120, or concurrent enrollment in GEOG 120
Transfer acceptability: CSU
Course provides students with knowledge and practical experience in the fundamentals of database management, and the acquisition, conversion, and creation of spatial data within Geographic Information Systems (GIS). Topics to include strategic design, querying, modeling techniques, data appropriateness and accuracy, hardware and software requirements, conversion of digital data, creating digital data using digitizers, scanners and Global Positioning Systems (GPS), and utilization of remote sensing, photogrammetry, and web-based data. This course provides hands-on experience with database management and data acquisition using ArcGIS software.
- GEOG 134 GIS Applications and Programming** (2)
1 hour lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in GEOG 120
Transfer acceptability: CSU
Provides students with advanced knowledge and practical experience in developing Geographic Information Systems (GIS) applications. Students will learn the fundamentals of GIS and database programming, as well as the customization of GIS applications. The lab provides hands-on experience with GIS programming using Visual Basic for Applications (VBA), data management using geodatabases, and applications development using ArcObjects.
- GEOG 136 Intermediate ArcGIS: GIS Analysis** (2)
1 hour lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in GEOG 120
Transfer acceptability: CSU
Focus on performing complex operations using the ArcGIS software. Students will gain hands-on experience in advanced querying operations, Spatial Analyst and Network Analyst, coordinate geometry, ArcGIS ModelBuilder, and the application of ArcGIS in a variety of disciplines.
- GEOG 138 GIS Internship** (2)
6 hours laboratory
Prerequisite: A minimum grade of 'C' in GEOG 120
Note: May be taken 2 times
Transfer acceptability: CSU
The Geographic Information Systems (GIS) internship is a directed program allowing students to apply classroom instruction to real-world GIS problem solving by working with a government or private agency. Students will be under the supervision of an instructor from the college and an advisor from the agency while working in one or more aspects of GIS operations.
- GEOG 140 Introduction to Remote Sensing** (1)
1 hour lecture
Recommended preparation: Basic familiarity with computers and the windows operating system.
Transfer acceptability: CSU
Provides students with a basic understanding of remote sensing theory and implementation. Topics include satellite imageries, data acquisition, and image interpretation.
- GEOG 141 Transportation Systems Analysis** (1)
1 hour lecture
Prerequisite: A minimum grade of 'C' in GEOG 120
Transfer acceptability: CSU
Provides students with more advanced practical experience in applying GIS to transportation systems. Students will gain more advanced hands-on experience using GIS as a tool to help model transportation planning, find the shortest routes, and analyze service areas and optimum routing. Introduces students to ESRI's network analyst extension and the various ways this tool can enhance transportation analysis.
- GEOG 142 Environmental Applications of GIS** (1)
1 hour lecture
Prerequisite: A minimum grade of 'C' in GEOG 120
Transfer acceptability: CSU
Provides students with knowledge and practical experience in the application of GIS in an environmental setting. We will explore how location-based GIS tools are used in many areas of environmental management such as natural disasters, biodiversity, water resources, and pollution. Case studies will be used to explore and understand how GIS is being used to help preserve the earth's resources and environment.
- GEOG 143 Introduction to Cartography and Computer Mapping** (1)
2 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in GEOG 120
Transfer acceptability: CSU
Provides the technical and design skills needed to create an effective map using Geographic Information Systems (GIS). Students will receive a review on map projection, coordinate systems, and datum transformation issues. In addition, students will learn about map templates, map annotations, and other tools that are used to enhance spatial data presentation.
- GEOG 150 Geographic Information Science and Spatial Reasoning** (3)
2 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in MATH 60
Transfer acceptability: CSU
An introduction to spatial analyses and spatial distribution theories within the field of Geographic Information Science (GISci). Students will learn about fundamentals of cartography, GIS theory, global positioning systems, spatial relationships, and remote sensing in this course. Students will analyze environmental problems and the human landscape by using open-source GIS software packages to visualize, query, manipulate, and interpret temporal and spatial data.
- GEOG 195 Regional Field Studies in Geography** (1, 2, 3)
 $\frac{1}{2}$, 1, or $1\frac{1}{2}$ hours lecture - $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, or $4\frac{1}{2}$ hours laboratory
Transfer acceptability: CSU; UC – Credit determined by UC upon review of course syllabus.
Extended field studies of the geography of selected regions. Emphasis upon field observation and interpretation of climate, meteorology, vegetation, soils, and landforms.
- GEOG 295 Directed Study in Geography** (1, 2, 3)
3, 6, or 9 hours laboratory
Prerequisite: Approval of project or research by instructor
Note: May be taken 4 times for a maximum of six units
Transfer acceptability: CSU; UC – Credit determined by UC upon review of course syllabus.
Independent study for students who have demonstrated skills and/or proficiencies in geography subjects and have the initiative to work independently on projects or research outside the context of regularly scheduled classes. Students will work under the personal supervision of an instructor.