

Geography

Degree: A.S. - General Science
A.S. - Geographic Information Systems
A.S. - Math/Physical Science
A.A. - Social Science
Certificate: Geographic Information Systems

Area: Science and Engineering
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The study of geography investigates the spatial variation in natural and human phenomena, such as climate, landforms, vegetation, cultural diversity, and resource utilization. Geographers use this understanding to explain the character of regions; to ascertain the ways in which humans—historical and contemporary—have utilized and shaped the earth's surface; and to predict future patterns and interactions between humans and the natural environment.

Geographic Information Systems (GIS)

Geographic Information System (GIS) is an emerging, powerful technology used to capture, store, transform, manage, analyze, and display spatial information. This technology has a wide range of applications in planning decisions by government agencies, business, and industry. According to an Environmental Sciences Research Institute survey, over 80 percent of the data used for decision-making in government and industry has a spatial component. New areas of rapid growth are in criminal analysis, marketing, retail site location, banking, healthcare planning, insurance, and real estate.

Career Opportunities

Most local, state, and federal government agencies use GIS, as do businesses, planners, architects, foresters, geologists, archeologists, and so on. The growth of GIS has been a marketing phenomenon of amazing breadth and depth and will remain so for many years to come. It is likely that all students, regardless of their particular field of interest, will at least come across and probably use a GIS in some way in the years ahead. The purpose of this program is to prepare students for careers in this expanding technology.

Mathematics - Physical Science

Requirements for Degree Major

18 units of transfer level course work in addition to other graduation requirements. Courses may be selected from astronomy, chemistry, engineering, geology, mathematics, physical geography, physical science, physics and statistics. See graduation requirements.

General Science

Requirements for Degree Major

18 units of transfer level course work in science in addition to other graduation requirements. Two laboratory courses must be included, one in a physical science and one in a biological. Courses may be selected from anatomy, astronomy, bacteriology, biology, botany, chemistry, geology, physical anthropology, physical geography, physical science, physiology, physics and zoology. See ARC graduation requirements.

Social Science

Requirements for Degree Major

18 units of transfer-level work in addition to other graduation requirements.

Courses taken must be in at least four of the following areas: Anthropology, Economics, Geography, History, Philosophy, Political Science, Psychology (except Psychology 335), and Sociology.

Geographic Information Systems

Two certificates in GIS are offered. The GIS certificate is offered for students interested in traditional analysis of spatial phenomena using GIS with applications in geography, forestry, natural resource management, economics, marketing, criminology, etc. The GIS-Web Applications and Programming certificate emphasizes the computer science aspects of GIS, including database design, database management, programming, web-page design, and internet applications.

Requirements for Degree Major: 35 units

Core Requirements	Units
GEOG 330	3
<i>and 6 units from the following:</i>	
ANTH 320	3
BIOL 300	3
BIOL 303	4
BIOL 310	4
BIOL 352	3

Geography

BUS 110	3
CHEM 320	4
FT 300	3
GEOG 300	3
GEOG 308	3
GEOG 310	3
GEOG 300	3
GEOG 305	3
GEOG 330	3
MKT 300	3
NATR 300	3
NATR 302	3
NATR 304	3
NATR 320	3
PS 300	3
RE 300	3

Concentration Requirements	Units
GEOG 334	4
GEOG 340	3
GEOG 344	3
GEOG 350	3
GEOG 354	1
GEOG 360	3
GEOG 370	2
GEOG 371	2
GEOG 380	4
GEOG 498 (1-3 units)	1

Recommended Electives

CISA 310, 311, 320, 321, 340; CISP 350, 370, 409; DESGN 100

Requirements for Certificate: 27 units

Courses Required	Units
GEOG 330	3
GEOG 334	4
GEOG 340	3
GEOG 344	3
GEOG 350	3
GEOG 354	1
GEOG 360	3
GEOG 370 or 371	2
GEOG 380	4
GEOG 498 (1-3 units)	1

GEOG 300 Physical Geography: Exploring Earth's Environmental Systems 3 Units

Formerly: GEOG 1

Prerequisite: None

Advisory: MATH 100, ENGRD 116, ENGWR 51, or ESLW 310.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course presents a systematic survey of the physical earth and the natural processes that influence humankind. The course provides an introduction to the use of maps and other tools employed in the analysis of patterns of weather, climate, soils, landforms, and vegetation. (CAN GEOG 2) AA/AS area A; CSU area B1; IGETC area 5A

GEOG 301 Physical Geography Laboratory 1 Unit

Formerly: GEOG 11

Prerequisite: None

Corequisite: GEOG 300.

Course Transferable to UC/CSU

Hours: 54 hours LAB

This course is a laboratory study of basic principles and concepts involved in understanding Earth's physical systems. Units feature observation, measurement, and analysis in energy, weather and climate, vegetation, soils, landforms, and environmental hazards. In addition to computer applications, construction of maps and interpretation of remote sensing data are integral activities. AA/AS area A; CSU area B1; IGETC area 5A.

GEOG 306 Weather and Climate 3 Units

Formerly: GEOG 6

Prerequisite: None

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is an introduction to atmospheric processes including energy and moisture exchanges, atmospheric pressure, winds and global circulation. Severe weather conditions such as hurricanes and tornadoes are studied. World, regional and local climates are investigated. Student work will include weather observations and analysis using charts, weather maps and instruments for obtaining atmospheric data.

GEOG 307 Environmental Hazards and Natural Disasters (same as Geology 325) 3 Units

Formerly: GEOG 13

Prerequisite: None

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers the environmental effects and applications of Earth-related processes. It focuses on earthquakes, volcanic eruptions, landslides, and flooding; availability and exploitation of natural resources; waste disposal; and global climate change. Humans as a force in environmental change will be emphasized. The course addresses geology, engineering, environmental studies, geography, and science education. One field trip is required. Not open to students who have completed GEOL 325. AA/AS area A; CSU area B1.

GEOG 308 Introduction to Oceanography 3 Units

Formerly: GEOG 7

Prerequisite: None

Advisory: GEOG 300 or GEOL 300.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is an integrated study of water on earth emphasizing physical oceanography, ocean and shoreline processes, plate tectonics, sea floor morphology, ocean chemistry, marine resources, and environmental concerns. Students will gain familiarity with regional physical shoreline features and processes through a field trip, completion of a paper, and class discussions. Not open to students who have completed GEOL 330. AA/AS area A

GEOG 309 Introduction to Oceanography Lab 1 Unit

Formerly: GEOG 7L

Prerequisite: None

Corequisite: GEOG 308 or GEOL 330.

Advisory: GEOG 300 or GEOL 300.

Course Transferable to UC/CSU

Hours: 54 hours LAB

This course is a laboratory investigation of water on earth, emphasizing the shape of the sea floor, marine navigation, plate tectonics, sea floor materials and their utilization, the physical and chemical nature of sea water, currents, tides, and marine weather. Not open to students who have completed GEOL 331.

GEOG 310 Human Geography: Exploring Earth's Cultural Landscapes 3 Units

Formerly: GEOG 2

Prerequisite: None

Advisory: ENGRD 116 or ESLR 320; ENGWR 51 or ESLW 310; MATH 32.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course considers the diverse patterns of human development, attitudes, and movement on earth. People's various societal and economic systems and

their different levels of interaction with nature are studied. World population and world food systems are surveyed and analyzed. The growth of cities and urban areas are considered, as are aspects of regional planning. The goal is to gain an understanding of people's place on earth and, thus, improve human relations and also people's relationship to the earth. (CAN GEOG 4) AA/AS area C2 & F; CSU area D3; IGETC area 4.

GEOG 320 World Regional Geography 3 Units

Formerly: GEOG 10

Prerequisite: ENGRD 116 or placement through assessment process.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is a global survey of the world's cultural regions. Basic geographic concepts and ideas are used to study and compare people, resources, landscapes, livelihood and economics, and origins across eight major geographic regions. The interaction of countries and regions, their global roles, and the conflicting pressures of cultural diversity versus globalization are presented. The widening gap between more developed and less developed countries is integrated throughout the course. Cultural and ethnic diversity, as it pertains to the expanding population of the United States, is evaluated throughout the course. AA/AS area 3C2, 3F; CSU area D3; IGETC area 4.

GEOG 322 Geography of California 3 Units

Formerly: GEOG 21

Prerequisite: None

Advisory: ENGRD 116 or ESLR 320, MATH 32, ENGWR 51 or ESLW 310, or placement through the assessment process.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is a study of the various natural and cultural environments of California, with special emphasis on the interaction of landforms, climate, natural vegetation, soils and resources with people. Historical, political and economic development within this diverse environment is presented. The diversity of cultures which make up the state's expanding population are studied and compared. Analysis of relevant issues of the day including those based on ethnic and cultural differences form an integral part of the course. CSU area D3; IGETC area 4.

GEOG 330 Introduction to Geographic Information Systems 3 Units

Formerly: GEOG 9

Prerequisite: None

Advisory: CISC 300 (Windows Operating System).

Course Transferable to UC/CSU

Hours: 54 hours LEC

A Geographic Information System (GIS) is a computer-based data processing tool used to manage and analyze spatial information. Applications of GIS include environmental assessment, analysis of natural hazards, site analysis for business and industry, resource management and land-use planning. This course introduces students to the concepts, techniques, and tools of GIS including data acquisition, management, manipulation and analysis, and cartographic output. Through hands-on exercises and/or projects, students will acquire skills and a conceptual base on which they can build further expertise in GIS. AA/AS area D2

GEOG 334 Introduction to Desktop GIS 4 Units

Prerequisite: None

Course Not Transferable UC or CSU

Hours: 60 hours LEC; 36 hours LAB

This course provides the foundation for and experience with using desktop geographic information system software (such as Arc View 3.x and Arc GIS 8.x). It also provides the conceptual overview and practice needed to take advantage of the software's display and attribute querying functions. Emphasis is placed on basic software functionality, database construction, spatial analysis/querying, cartographic presentation, and management. Software capabilities for spatial analysis and network analysis will be explored. This course may be taken four times on a different software package or version

GEOG 340 Cartographic Design for GIS 3 Units

Formerly: GEOG 20

Prerequisite: GEOG 330 with a grade of "C" or better.

Advisory: CISC 300 (IBM Compatible Computers and Microsoft Windows).

Course Transferable to CSU

Hours: 54 hours LEC

This course provides a comprehensive study of GIS applicable cartography including cartographic principles. Data acquisition methods used in map production, and methods of base map development. The course will include the study of cartography to include history, principles, map projections, map scale, types of thematic maps, and map accuracy. Techniques used in GIS base map development (scanning, digitizing, and coordinate geometry) will be introduced using hands-on exercises. The course will include the production and presentation techniques of professional quality maps. The course will include hands-on work in computer-assisted mapping projects.

GEOG 344 Spatial Analysis and Modeling in GIS 3 Units

Formerly: GEOG 23

Prerequisite: GEOG 330 with a grade of "C" or better.

Advisory: CISC 300 (IBM compatible Computers and Microsoft Windows); STAT 301.

Course Transferable to CSU

Hours: 54 hours LEC

This course provides a general survey of the fundamentals of spatial information systems and a survey of quantitative techniques applicable to spatial data. This course is focused on the functionality of GIS as an effective tool for modeling and analyzing complex spatial relationships quantitative methods, to include measures of central tendency, dispersion, and density, are discussed. Applications of such methods will be presented using empirical data.

GEOG 350 Data Acquisition in GIS 3 Units

Formerly: GEOG 26

Prerequisite: None

Course Transferable to CSU

Hours: 54 hours LEC

This course provides students with the knowledge and practical experience necessary to develop skills in the acquisition, conversion, and creation of spatial data. Topics include acquisition of existing data, metadata, conversion in format of digital data, creating digital data utilizing digitizers and scanners, the utilization of remote sensing data, and the Global Positioning System.

GEOG 354 Introduction to the Global Positioning System (GPS) 1 Unit

Formerly: GEOG 14

Prerequisite: None

Advisory: GEOG 300, GEOG 301.

Course Transferable to CSU

Hours: 18 hours LEC

This course will introduce the Global Positioning System (GPS), including the conceptual basis for GPS and hands-on operation of the technology, including computer interfaces, GIS software, and real-world applications. Recommended for anyone needing to acquire, process, or display location information.

GEOG 360 Database Design and Management in GIS 3 Units

Formerly: GEOG 22

Prerequisite: GEOG 330 with a grade of "C" or better.

Advisory: CISC 300, CISA 320, CISA 321.

Course Transferable to CSU

Hours: 54 hours LEC

This course examines the principles of database management and design including conversion fundamentals, modeling techniques and strategic planning. The needs, alternatives, and pitfalls of database development and conversion are discussed. In addition, this course also includes the examination of various types of data applicable to GIS and examines relevant issues including

hardware and software requirements. Particular attention is paid to determining the appropriate methodology, developing a conversion plan, and data quality assurance. This course includes hands-on practical exercises in database management skills.

GEOG 370 Introduction to GIS Programming 2 Units

Formerly: GEOG 27A

Prerequisite: GEOG 333.

Course Transferable to CSU

Hours: 30 hours LEC; 18 hours LAB

This course introduces students to programming in GIS utilizing ArcView's Proprietary programming language, Avenue. GIS programming allows the user to modify and customize ArcView's graphic user interface (GUI). Students will utilize this programming language to modify GIS tools and commands.

GEOG 371 Intermediate GIS Programming 2 Units

Formerly: GEOG 27B

Prerequisite: GEOG 370, or GEOG 330 and CISP 370.

Course Transferable to CSU

Hours: 30 hours LEC; 18 hours LAB

This course provides the necessary foundation to become a GIS applications developer with such software languages as Avenue, Map Objects, and Arc Objects. This course will concentrate on building GIS programming functionality into the Visual Basic application environment. Students will learn how to embed GIS functionality into powerful programming languages such as Visual Basic, C++, Oracle FORMS, and Delphi. The programming languages utilized comprise several geographic functions including geographic query, spatial analysis, encoding, thematic display, and data integration.

GEOG 380 Intermediate Desktop GIS with Applications 4 Units

Formerly: GEOG 28A

Prerequisite: GEOG 330 and one course from the following: GEOG 340, 344, 350, or 360 with a grade of "C" or better.

Course Transferable to CSU

Hours: 54 hours LEC; 54 hours LAB

This course provides an overview of a full-feature, powerful desktop GIS software (such as ArcGIS 8.x). Software will be used to apply reprocessing concepts to solving geographic problems. Emphasis is placed on the software's topological data model, geodatabase model, creating and editing spatial data to produce map displays, working with attribute data, and the basics of grid processing. This course may be taken four times on a different software package or version.

GEOG 385 Introduction to Web Based GIS Application Development 4 Units

Formerly: GEOG 29

Prerequisite: GEOG 330 and CISW 300.

Advisory: CISW 310.

Course Transferable to CSU

Hours: 63 hours LEC; 27 hours LAB

This course introduces the development of web-based GIS solutions. Web-authoring tools and Internet map servers (such as ArcIMS) will be used to teach the techniques of Internet mapping and interactive user interface design for GIS applications. Focus will be on the theories and principles behind Internet mapping to perform spatial analysis, on GIS application development, and on web design for Internet mapping systems.

GEOG 390 Field Studies in Geography .5-4 Units

Formerly: GEOG 24

Prerequisite: None

Course Transferable to CSU

Hours: 3-24 hours LEC; 18-144 hours LAB

This course involves field study of selected locations of geographic interest. Course content will vary according to field destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, geology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities,

transportation issues, land use patterns, etc.), and/or introduction to tools and techniques used for geographic field research (e.g., map and compass, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required. May be taken 4 times for a maximum of 6 units.

GEOG 498 Work Experience in Geographic Information Systems 1-3 Units

Formerly: GEOG 48

Prerequisite: Placement in an agency, private business, non-profit organization, or other entity.

Corequisite: GEOG 330 and student must be enrolled in a minimum of 7 units, including this course.

Course Transferable to CSU

Hours: 18 hours LEC; 75-225 hours paid or 60-180 non-paid LAB

This course is a directed field study program that provides students with an opportunity to apply classroom instruction in geographic information systems to real-world GIS projects in the community. Students will be under the supervision of an advisor from the college while participating in a short-term work experience program in business or government agency.