

# Geography

In the College of Arts and Letters

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## Faculty

Emeritus: Blick, Eidemiller, Greenwood, Johnson, Keen,  
Kiewiet de Jonge, O'Brien, Pryde, Quastler, Storm, Taylor,  
Wright, Yahr  
Chair: Aguado  
The Stephen and Mary Birch Foundation Chair in Geographical  
Studies: Getis  
Professors: Aguado, Aitken, Ford, Fredrich, Getis, Griffin, Hope,  
Jankowski, McArthur, O'Leary, Stow, Stutz, Weeks  
Associate Professor: Rey  
Assistant Professors: Bosco, Pohl, Tague, Tsou

## Offered by the Department

Doctor of Philosophy degree in geography.  
Master of Arts degree in geography.  
Major in geography with the B.A. degree in liberal arts and sciences.  
Emphasis in methods of geographical analysis.  
Emphasis in natural resource and environmental geography.  
Emphasis in physical geography.  
Emphasis in urban and regional analysis.  
Minor in geography.  
Certificate in geographic information science.

## The Stephen and Mary Birch Foundation Chair in Geographical Studies

The Stephen and Mary Birch Foundation Chair in Geographical Studies was created through the Birch Foundation's grant to the Geography Department to endow a chair and create a Center for Earth Systems Analysis Research. Dr. Arthur Getis, internationally recognized for his expertise in theory and methodology of spatial analysis applied to urban and economic systems, is the second holder of the Chair.

## The Major

Geography is the study of spatial aspects of the physical environment, human activities and landscapes, and the nature of their interactions. Geographers draw upon theories from both the physical and social sciences. As physical scientists, they study the processes and resulting features of the earth's surface, such as vegetation, climate, soils, landforms, and resources. As social scientists, geographers explore such topics as the arrangement of societies on the earth's surface, land use patterns, urbanization, resource and energy usage, and environmental conservation.

The Department of Geography offers a broad range of fields from which to select an emphasis. These include physical geography—focusing on scientific explanations of the earth's physical features and processes; natural resource and environmental geography—concerned with human impacts on the earth; urban and regional analysis—dealing with the form of cities and the dynamics of regional systems; methods of geographical analysis—providing a background in cartography, geographic information systems, remote sensing and spatial statistics. A comprehensive program is offered in general geography—encompassing topics from all of the emphases.

The Department also offers a Certificate in Geographic Information Science. This program is for students interested in mapping, computer graphics, surveying, aerial photography, and the use of satellite technology to study earth resources. A variety of career opportunities exist for geography majors. In recent years many graduates with bachelor degrees have entered the fields of urban and environmental planning, both in the public and private sectors. Employment is also available as geographic information systems specialists, cartographers, park naturalists, and remote sensing specialists. The following represent some of the jobs held by recent graduates: environmental

impact analyst, urban planner, cartographer, park ranger, transportation planner, travel agent, teacher, zoning investigator, terrain analyst. Some graduates have chosen to pursue opportunities in business where firms are interested in hiring college graduates with broad academic backgrounds.

## Advising

All College of Arts and Letters majors are urged to consult with their department adviser as soon as possible; they are required to meet with their department adviser within the first two semesters after declaration or change of major.

## Geography Major

**With the B.A. Degree in Liberal Arts and Sciences**  
**(Major Code: 22061)**

All candidates for a degree in liberal arts and sciences must complete the graduation requirements listed in the section of this catalog on "Graduation Requirements." No more than 48 units in geography courses can apply to the degree.

**Graduation with Distinction.** A student desiring to graduate with Distinction in Geography must meet the University requirements listed in the section of this catalog on "Graduation Requirements" and be recommended by the geography faculty.

### General Geography Program

A minor in another department approved by the undergraduate adviser in Geography is required for this degree.

**Preparation for the Major.** Geography 101, 101L, 102. (7 units)

**Foreign Language Requirement.** Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language as part of the preparation for the major. Refer to section of catalog on "Graduation Requirements."

**Upper Division Writing Requirement.** Passing the University Writing Examination or English 508W, 581W, 584W, or Rhetoric and Writing Studies 305W, 500W, 503W with a grade of C (2.0) or better.

**Major.** A minimum of 27 upper division units in geography to include three units selected from each of the following groups: (a) Geography 321-337; (b) 353-354, 554-559, 585-586; (c) 370, 378, 483, 545, 570-577; (d) 378, 401, 409, 504-511, 545; (e) 380-381; (f) 385, 484, 488, 584-588, and nine units from one of the following groups: (a) Physical: Geography 378, 401, 409, 504-511, 545; (b) Natural Resource and Environmental: 370, 378, 545, 570-577; (c) Urban and Regional Analysis: 353-354, 385, 554-559, 585-586; (d) Methods of Geographical Analysis: 380-385, 484, 488, 584-588; (e) Cultural: 354, 554, but not more than six units from Geography 312, 321-339. No course may be used more than once to satisfy this requirement.

### Emphasis in Methods of Geographical Analysis

Students selecting this emphasis are not required to complete a minor in another department.

**Preparation for the Major.** Geography 101, 101L, 102; Computer Science 106 or 107; and a three-unit course in introductory statistics. (13 units)

**Foreign Language Requirement.** Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language as part of the preparation for the major. Refer to section of catalog on "Graduation Requirements."

**Upper Division Writing Requirement.** Passing the University Writing Examination or English 508W, 581W, 584W, or Rhetoric and Writing Studies 305W, 500W, 503W, with a grade of C (2.0) or better.

**Major.** A minimum of 36 upper division units in geography to include Geography 385; 15 units selected from Geography 380-381, 484, 488, 498, 584-588\*; three units selected from each of the following groups: (a) 321-337; (b) 370, 483, 545, 570-577; (c) 353-354, 554-559; six units selected from Geography 378, 401, 409, 504-511; and three units of upper division geography electives.

\* Geography 595 may be used to satisfy three units in this group where appropriate and approved by the department.

### Emphasis in Natural Resource and Environmental Geography

Students selecting this emphasis are not required to complete a minor in another department.

Students may select either track (a) Environmental Analysis or track (b) Environmental Policy.

**Preparation for the Major.** Geography 101, 101L, 102; Biology 100 and 100L; Political Science 102. (14 units)

**Foreign Language Requirement.** Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language as part of the preparation for the major. Refer to section of catalog on "Graduation Requirements."

**Upper Division Writing Requirement.** Passing the University Writing Examination or English 508W, 581W, 584W, or Rhetoric and Writing Studies 305W, 500W, 503W, with a grade of C (2.0) or better.

#### Track (a): Environmental Analysis

**Additional Preparation for the major.** Mathematics 121 or 150; Chemistry 100; and Physics 107. (11-13 units)

**Major.** A minimum of 36 upper division units in geography to include Geography 370 and 385; three units from 380-381; three units from 321-337; six units from 378, 401, 409, 504-511, and three units from 353-354, 554-559.

An additional 15 units to be selected from 3 or 4 units from Geography 484 or 488, three units from 584-588 and 9 units from 483, 545, 570-577, 595.

#### Track (b): Environmental Policy

**Additional Preparation for the major.** Economics 101 or 102. (3 units)

**Major.** A minimum of 36 upper division units in geography to include Geography 370 and 385; three units from 380-381; three units from 321-337; six units from 378, 401, 409, 504-511, and three units from 353-354, 554-559.

An additional 15 units to be selected from 3 or 4 units from Geography 484 or 488, 584-588 and 12 units from 483, 545, 570-577, 595.

### Emphasis in Physical Geography

Students selecting this emphasis are not required to complete a minor in another department.

**Preparation for the Major.** Geography 101, 101L, 102; Mathematics 121 or 150; Chemistry 200; Physics 180A, 182A. (19-21 units)

**Foreign Language Requirement.** Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language as part of the preparation for the major. Refer to section of catalog on "Graduation Requirements."

**Upper Division Writing Requirement.** Passing the University Writing Examination or English 508W, 581W, 584W, or Rhetoric and Writing Studies 305W, 500W, 503W, with a grade of C (2.0) or better.

**Major.** A minimum of 36 upper division units in geography to include Geography 380, 385; fifteen units selected from Geography 378, 401, 409, 498, 504-511\*; six units selected from Geography 484, 488, 584-588; and three units selected from each of the following groups: (a) 321-337; (b) 353-370, 545, 554-577; and three units of electives.

\* Geography 595 may be used to satisfy three units in this group where appropriate and approved by the department.

### Emphasis in Urban and Regional Analysis

Students selecting this emphasis are not required to complete a minor in another department.

**Preparation for the Major.** Geography 101, 101L, 102; Computer Science 106 or 107; Economics 102. (13 units)

**Foreign Language Requirement.** Competency (successfully completing the third college semester or fifth college quarter) is required in one foreign language as part of the preparation for the major. Refer to section of catalog on "Graduation Requirements."

**Upper Division Writing Requirement.** Passing the University Writing Examination or English 508W, 581W, 584W, or Rhetoric and Writing Studies 305W, 500W, 503W, with a grade of C (2.0) or better.

**Major.** A minimum of 36 upper division units in geography to include Geography 385; 15 units selected from Geography 353-354, 498, 554-559, 572, 585-586\*; six units selected from 378, 401, 409, 504-511; three additional units from each of the following groups: (a) 321-337; (b) 370, 483, 545, 570-577; (c) 380-381; and three units of electives.

\* Geography 595 may be used to satisfy three units in this group where appropriate and approved by the department.

## Geography Major

### With the B.S. Degree in Applied Arts and Sciences

San Diego State University is in the process of securing approval for the B.S. degree in Geography. For further information, contact the Department of Geography.

### Emphasis in Geographic Information Science

Students selecting this emphasis are not required to complete a minor in another department.

**Preparation for the Major.** Geography 101, 101L, 102; Biology 100, 100L; Chemistry 200; Computer Engineering 160, 260; Mathematics 121, 122; Physics 180A, 182A; Statistics 250. (41 units)

**Major.** A minimum of 36 upper division units to include Geography 381, 385, 484, 488, 585; and 21 units of upper division electives selected as follows: six units from Geography 483, 581-595; nine units from Geography 370, 378, 401, 409, 504-511, 545, 570-577; three units from Geography 353-358, 554-559; three units from Computer Engineering 361, 375, 460, or Computer Science 310, 320.

## Geography Minor

The minor in geography consists of a minimum of 18-19 units of geography to include Geography 101, 102 and one of the following areas:

**Cultural:** Six units from Geography 312, 354, 554, and six units selected from regional courses Geography 321-337.

**Methods of Geographical Analysis:** Nine units selected from Geography 380-385, 484, 488, 584-588, and three units selected from any other upper division course.

**Natural Resource and Environment:** Nine units selected from Geography 370, 378, 483, 545, 570-577, and three or four units selected from methods courses Geography 380-385, 484, 488, 584-588.

**Physical:** Nine units selected from Geography 378, 401, 409, 504-511, 545, and three or four units selected from methods courses Geography 380-385, 484, 488, 584-588.

**Urban and Regional Analysis:** Nine units selected from Geography 353-354, 554-559, and three or four units from either methods or regional courses Geography 321-337, 380-385, 484, 488, 584-588.

Courses in the minor may not be counted toward the major, but may be used to satisfy preparation for the major and general education requirements, if applicable. A minimum of six upper division units must be completed in residence at San Diego State University.

## Geographic Information Science Certificate\*

The purpose of the program is to prepare students to acquire, manage, and visualize geospatial data in public and private organizations. Students must apply for admission to the program before the completion of 12 certificate units and must complete the required units with a 2.5 grade point average.

The certificate requires 27 units distributed between the Departments of Geography and Computer Science as follows: 12-15 units selected from Geography 381, 484, 488, 584, 585, 588 and 12-15 units selected from Computer Science 107, 108, 220, 310, 320, 503, 514, 520, 535, 551, 575. Courses with relevant content may be substituted for the geography and computer science courses with the approval of the certificate adviser. Courses in the certificate may be counted toward the major in geography but may not be counted toward the minor.

\* Additional prerequisites required for this certificate.

## Courses (GEOG)

### LOWER DIVISION COURSES

#### 101. Principles of Physical Geography (3) I, II (CAN GEOG 2)

Principles underlying the fundamental nature and dynamics of the physical world: the atmosphere, hydrosphere, biosphere, lithosphere, and their systematic spatial relationships.

#### 101L. Physical Geography Laboratory (1) I, II

Three hours of laboratory.

Prerequisite: Credit or concurrent registration in Geography 101.

Practical exercise and observation in map analysis, weather elements, climatic regions, and the earth's landform features. Designed to supplement Geography 101.

#### 102. Principles of Cultural Geography (3) I, II (CAN GEOG 4)

Introduction to cultural geography, covering the elements of culture, such as technology, language, religion, political organization, methods of livelihood, settlement patterns and population, and the regional distribution of these elements over the earth. Field trips may be arranged.

#### 103. Weather and Climate (3) I, II

The composition, structure, and circulation of the atmosphere, including elementary theory of storms and other weather disturbances.

#### 106. World Regional Geography (3) I, II

Cultural and world geography, focusing on elements of culture as applied to regions of the world: ethnicity, language, religion, urbanization, economics, political organization. Alternative conceptions about geography held by children, adults, and individuals of different cultures.

#### 296. Experimental Topics (1-4)

Selected topics. May be repeated with new context. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree.

### UPPER DIVISION COURSES (Intended for Undergraduates)

#### 312. Culture Worlds (3) I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences.

Geographical characteristics and development of major cultural realms of the world. Spatial components of contemporary conflict within and between these regions. Not open to students with credit in Geography 106.

#### 321. United States (3) I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Systematic and regional analysis of physical and cultural landscapes of the United States.

#### 323. Middle America (3) I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

The land and peoples of Mexico, Central America, and the islands of the Caribbean; a survey of the resources, economies, and trade of the region. Field trips may be arranged.

#### 324. South America (3)

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

The physical regions and human geography of South America, including the history of colonization and the exploitation of resources.

#### 336. Europe (3)

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Systematic analysis of the geographic bases of modern European life. Regional investigation of countries of Europe except the Soviet Union.

#### 337. Republics of the Former Soviet Union (3)

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Ethnic composition, industrial and agricultural resources, demographics, and environmental management in this region, with an emphasis on the various cultural regions.

#### 353. Location of Economic Activity (3)

Prerequisite recommended: Geography 101 or 102.

International arrangement and interrelationship of resources, production, exchange and consumption; principles and theory in industrial location; world trade and economic development selecting favorable locations for capital investments, determining growth potential of service and market areas, meeting environmental impact requirements.

#### 354. Geography of Cities (3) I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Survey of the location, function and spread of cities; the spatial and functional arrangement of activities in cities, leading to an analysis of current urban problems: sprawl, city decline, metropolitan transportation. Field trips may be arranged.

### **370. Environmental and Natural Resource Conservation (3) I, II**

Prerequisites: Geography 101 or 102; and completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for nonmajors.

Quality of environmental and natural resources within changing human and natural systems: pollution problems; preservation of open space, habitats, and wilderness; and conservation of natural resources.

### **378. Environmental Physiography (3)**

Prerequisites: Geography 101 and Mathematics 121 or 150.

Introduction to environmental physiographic dynamics. Assessment of man's role in these dynamics and their effect on urban and rural land use, including such topics as induced erosion, landslides, and flooding.

### **380. Map Investigation (3) I, II**

Two lectures and three hours of laboratory.

Prerequisite: Geography 101 or 102.

Use of the map as an analytical tool in geography. History of developments in cartography.

### **381. Maps and Graphic Methods (3) I, II**

Two lectures and three hours of laboratory.

Prerequisite: Geography 101 or 102.

The art and science of creating graphs and maps as media for describing and analyzing geographic phenomena. Laboratory instruction and practice in cartographic techniques with emphasis on presenting quantitative data.

### **385. Spatial Data Analysis (3) I, II**

Prerequisites: Geography 101 or 102; Statistics 250 or comparable course in statistics.

Analysis of spatially distributed data including computer applications. Spatial sampling, descriptive statistics for areal data, inferential statistics, use of maps in data analysis.

### **401. Physiography (3)**

Prerequisite: Geography 101.

Morphology and genetic interpretation of the relief features of the earth's surface.

### **409. Global Climate Change (3)**

Prerequisite: Geography 101 or 103.

Global climate system and feedbacks with biosphere. Past climates and potential future changes, including changes in greenhouse gases, ozone depletion and acid rain. Predictions and uncertainty regarding changes including natural and anthropogenic causes.

### **483. Watershed Analysis (3) II**

Prerequisite: Geography 101.

Watershed analysis is an organizing framework for collecting and analyzing scientific information to facilitate environmental management. Framework examined from both an ecological process and an environmental management perspective.

### **484. Geographic Information Systems (3)**

Two lectures and three hours of laboratory.

Prerequisite: Three units from Geography 380, 381, 488, or from computer programming.

Procedures for encoding, storage, management, and display of spatial data; theory of computer-assisted map analysis; examination of important geographic information systems.

### **488. Remote Sensing of Environment (4) I**

Three lectures and three hours of laboratory.

Prerequisite: Geography 101. Recommended: Physics 180A-180B.

Techniques for acquiring and interpreting remotely sensed data of environment. Electromagnetic radiation processes, aerial photographic systems, and human interpretation of aerial and satellite imagery. Geographic analysis of selected terrestrial, oceanographic, and atmospheric processes and resources.

### **496. Selected Studies in Geography (3)**

Prerequisite: Six units in geography.

Critical analysis of problems within a specific field of the discipline. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit six units. Field trips may be arranged.

### **498. Senior Thesis (3)**

Prerequisite: An overall grade point average of 3.0 and consent of department.

A written thesis based on an individual research project.

### **499. Special Study (1-3) I, II**

Individual study. Maximum credit six units.

## **UPPER DIVISION COURSES (Also Acceptable for Advanced Degrees)**

### **504. Coastal and Submarine Physiography (3)**

Prerequisites: Geography 101 and Mathematics 121 or 150.

Analysis of marine waves, of their modification in shallow waters, of coastal currents and tides. Interpretation of coastal and submarine relief in relation to environmental processes and their modification by humans. Field trips may be arranged.

### **505. Fluvial Geomorphology (3) I, II**

Prerequisite: Geography 401.

Physical foundation of river systems. Geographic variability in river channels and influence of human activities on fluvial forms and processes. Role of fluvial geomorphology in river and watershed management. Field trips may be arranged.

### **507. Geography of Natural Vegetation (3) I, II**

Prerequisite: Geography 101.

The natural vegetation associations of the world, their distribution, classification and development, including relationship to human activities. Field trips may be arranged.

### **508. Environmental Climatology (3)**

Prerequisites: Geography 103; Mathematics 121 or 150.

Interaction between the atmosphere and earth surface. Solar and thermal radiation, turbulent heat transfer, soil heat transfer. Change in the atmosphere due to natural variations and human activity. Impacts on the environment.

### **509. Regional Climatology (3)**

Prerequisite: Geography 103.

The causes of climatic types as they occur throughout the world. Principles of several climatic classifications.

### **511. Hydroclimatology (3)**

Prerequisites: Geography 101 or 103 and Mathematics 121 or 150.

Hydrologic cycle, energy and mass fluxes from the earth to the atmosphere and land-atmosphere interactions. Agricultural and hydrologic significance of spatial variability of energy and mass fluxes.

### **545. Arid Lands (3)**

Prerequisites: Geography 101 and 370; Biology 100 or 201B.

Physical geography and human use of arid lands. Traditional and modern land use systems in context of technological and economic development. Environmental and social impacts of development including desertification.

**554. World Cities: Comparative Approaches to Urbanization (3) II**

Prerequisite: Geography 354.

Worldwide trends in urbanization. Case studies of selected cities from various culture areas with focus on international variations in city structure and urban problems.

**556. Location and Spatial Structure of Cities (3)**

Prerequisite: Geography 354 or three units of upper division coursework in a related field.

Principles and characteristics of urban growth and settlement; the internal structure and functioning of urban centers; spatial models of urban land use; growth management, transportation problems, and sociopolitical urban problems. Field trips may be arranged.

**559. Urban Transportation Geography (3)**

Prerequisite: Three units of upper division urban or transportation coursework in geography or related field.

Urban transportation networks and their effects, past, present and future, on the economy and physical structure of the urban region. Field trips may be arranged.

**570. Environmental Resource Conservation (3)**

Prerequisite: Geography 370.

Management of environmental and natural resources. Effective programs and the institutional frameworks in which they occur.

**572. Land Use Analysis (3) II**

Prerequisite: Geography 370.

Problems of maintaining environmental quality in the process of land conversion from rural to urban uses with emphasis on land capability and suitability studies. Field trips may be arranged.

**573. Population and the Environment (3)**

Prerequisite: Geography 102.

Population distribution, growth, and characteristics as they relate to environmental degradation, both as causes and consequences. Roles of women, sustainable development, carrying capacity, optimum population, and policy initiatives in relationships between population and environment.

**574. Water Resources (3)**

Prerequisite: Geography 370.

Occurrence and utilization of water resources and the problems of water resource development. Field trips may be arranged.

**575. Geography of Recreational Land Use (3) I**

Prerequisite: Geography 101 or 102.

Importance of location and environment in the use, management, and quality of recreation areas. Field trips may be arranged.

**577. Geography of the National Parks (3)**

Prerequisite: Geography 370.

Human and land relationships in the national parks of the United States. Emphasis on problems arising from the preservation and use mandate under which parks are managed.

**584. Geographic Information Systems Applications (3)**

Two lectures and three hours of laboratory.

Prerequisite: Geography 484 or 588.

Conceptualization, completion, and implementation of geographic information systems (GIS) at local, regional, national, and global levels. Spatial analysis and modeling with GIS. GIS in planning, management, and research.

**585. Quantitative Methods in Geographic Research (3)**

Prerequisite: Geography 385.

Application of statistical techniques to geographic research including simple regression and correlation, multiple regression, classification, factor analysis, and computer applications.

**586. Qualitative Methods in Geographic Research (3) II**

Prerequisite: Geography 102.

Application of qualitative techniques to geographic research including reflexive survey design and in-depth interviews, non-obtrusive methods, landscape interpretation, textual methods and discourse analysis, feminist criticism, and humanistic and historical materialist perspectives on measurement.

**588. Intermediate Remote Sensing of Environment (4) II**

Three lectures and three hours of laboratory.

Prerequisites: Geography 385 and 488.

Multispectral remote sensor systems and interpretation of imagery from nonphotographic systems. Computer-assisted image processing. Geographic analysis of selected terrestrial, oceanographic, and atmospheric processes.

**595. Geographic Internship (3) I, II**

Prerequisites: Six upper division units in geography and consent of instructor.

Students will be assigned to various government agencies and industry and will work under the joint supervision of agency heads and the course instructor. Maximum credit three units.

**596. Advanced Topics in Geography (1-3)**

Prerequisite: Six upper division units in geography.

Advanced special topics in geography. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

**GRADUATE COURSES**

Refer to Bulletin of the Graduate Division.