Geography

In the College of Arts and Letters

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Faculty

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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 spatial pattern analysis, spatial statistics, urban structure, and spatial modelling, is the occupant of the Chair.

Associateships

Approximately 45 graduate teaching associateships and graduate research associateships in geography are available to highly qualified students. Applications and additional information may be secured from the department. The deadline for submitting applications for teaching associateships or research associateships is March 1 for the Master of Arts degree and February 1 for the Doctor of Philosophy degree. Applications for associateships must include transcripts, three letters of recommendation, and Graduate Record Examination (GRE) scores.

General Information

The Department of Geography offers graduate study leading to the Master of Arts and Doctor of Philosophy degrees in geography. In addition to the general M.A. program, it is possible to pursue a concentration in either natural resources and environmental policy or transportation.

The Master of Arts degree is designed to provide advanced training for (a) students who plan to terminate their graduate studies at the master's level, and (b) those who anticipate additional work leading to the doctoral degree in geography or related fields.

The Doctor of Philosophy program, offered jointly with the University of California, Santa Barbara, provides advanced training for research and teaching at the highest academic level.

Research and instructional facilities provided by the Department of Geography include an excellent map library, the Stephen and Mary Birch Center for Earth Systems Analysis Research (CESAR), a state-of-the-art image processing/GIS center, laboratories for physical geography, soils, cartography, meteorology, and remote sensing and aerial interpretation and equipment for field studies. The Social Science Research Laboratory provides specialized data collections in the social sciences and a well equipped data processing center.

Section I. Master's Degree Program

Admission to Graduate Study

All persons interested in admission to the master's program in geography should write directly to the M.A. Program Adviser, Department of Geography, for complete information on the program and its requirements.

Students will be considered for admission to the master's program in geography for the fall semester if they have submitted directly to the Department of Geography by March 1 the following materials:

1. Copies of transcripts from all colleges and universities attended.
2. Copies of GRE scores.
3. Three letters of recommendation from persons familiar with the academic performance or potential of the applicant.
4. A statement of the applicant's areas of interest and professional goals.

Concurrent with application to the department, the applicant must file a completed application for admission to San Diego State University with the Office of Admissions and Records (see Application Procedures section of the San Diego State University Graduate Bulletin). All application materials, including official transcripts from all previously attended colleges and universities, must be received by the Office of Admissions and Records by March 1 in order for the applicant to be considered for the fall semester.

The Geography Department does not encourage students to apply for admission for spring semester. Completed applications for spring admission must be submitted to the department and the Office of Admissions and Records by September 15. Satisfaction of the minimum requirements of San Diego State University or the Department of Geography does not guarantee admission to the master's program for either the fall or spring semester. Department requirements are normally a minimum grade point average

of 3.0 in the last 60 units taken as an undergraduate and a satisfactory score on the verbal and quantitative sections of the GRE.

Candidates whose preparation is deemed insufficient by the master's program committee will be required to complete specified courses in addition to the minimum 30 units required for the degree.

Advancement to Candidacy

All students must satisfy the general requirements for candidacy, as stated in Part Two of this bulletin.

Specific Requirements for the Master of Arts Degree

(Major Code: 22061)

In addition to meeting the requirements for classified graduate standing and the basic requirements for the master's degree as described in Part Two of this bulletin, the student must complete a graduate program of at least 30 units of upper division and graduate courses selected with the approval of the graduate advising committee. The student may choose from the General Program, the Concentration in Natural Resources and Environmental Policy, or the Concentration in Transportation.

General Program

The requirements for students electing the general program are as follows:

1. A minimum of 30 units of courses numbered 500 or above as approved by the geography department M.A. advising committee. At least 24 of these units must be from the geography department.
2. A minimum of 18 of the 30 units of coursework must be 600- or 700-level courses.
3. Geography 700 and 701, normally taken during the first two semesters.
4. Completion of Geography 799A (Thesis) under Plan A.

Concentration in Natural Resources and Environmental Policy

The requirements for students electing a concentration in natural resources and environmental policy are as follows:

1. A minimum of 30 units of which not more than six may be in disciplines other than geography.
2. A minimum of 18 units of 600- and 700-numbered courses, to include Geography 670, 700, 701, 770, 799A, and three units from courses numbered Geography 570-577.
3. A thesis in the area of natural resources or environmental quality management and policies.
4. Additional 500-, 600-, and 700-level coursework, as determined in consultation with the student's thesis committee, appropriate to successfully preparing the thesis.
5. Additionally, students in this concentration should take, or have already completed, three units from courses numbered Geography 581-588 or 682-688L.

Concentration in Transportation

The requirements for students electing a concentration in transportation are as follows:

1. A minimum of 30 units including 15 units of 600- and 700-numbered courses.
2. Geography 700, 701, and at least nine additional units to be taken from 500- and 600-level geography courses, as approved by the graduate advising committee.
3. At least six units selected from:
   Civil and Environmental Engineering 620
   Traffic Engineering (3)
   Civil and Environmental Engineering 622
   Mass Transit Engineering (3)
   Civil and Environmental Engineering 781
   Seminar in Transportation Engineering (2 or 3)
   City Planning 730
   Seminar in Urban Transportation Planning (3)
   Geography 798 Special Study (3) Cr/NC/SP

   Graduate or 500-level courses in other departments that are not listed above may be taken if approved by the graduate advising committee.
4. Geography 595 Geographic Internship (3)
   (Must be in approved transportation activity.)
5. Geography 799A Thesis (3) Cr/NC/SP
6. A student should have completed a quantitative methods course prior to initiating the program, or take Geography 585, Quantitative Methods in Geographic Research (3), concurrently.

Section II. Doctoral Program

(Major Code: 22061)

The cooperating faculties of the Department of Geography at San Diego State University and the University of California, Santa Barbara offer a joint doctoral program in geography. The research interests of the participating faculty members cover a range of geographic problems. The joint doctoral program offers work leading to the Ph.D. in the following systematic areas (Group A) with supporting development of skills in spatial techniques (Group B) as follows:

Systematic Areas – Group A

Human Geography
Spatial behavior
Urban and regional modeling
Comparative urbanization
Urban structure
Social theory

Environmental Geography
Natural resources management and policy

Physical Geography
Biogeography
Physical climatology and hydroclimatology
Coastal processes

Spatial Techniques – Group B

Remote Sensing and Image Processing
Geographic Information Systems and Computer Cartography
Spatial quantitative or qualitative techniques
Social theoretic techniques

Each student's program is designed around one of the areas selected from Group A and at least one of the technique emphases selected from Group B. The main regional foci are problems of Latin America, Western Europe, Australia-New Zealand, the former USSR, the Pacific Rim, Mexico-U.S. borderlands, and arid lands. Students must attain the requisite skills in programming, statistics, mathematics, and foreign language necessary to successfully pursue their research goals.

Admission to Doctoral Study

Applicants for admission to the doctoral program in geography offered jointly by SDSU and UCSB must meet the general requirements for admission to both universities with classified graduate standing as outlined in the respective current catalogs. There are no inflexible requirements for entrance to graduate study in this program, but a strong background in geography or a closely related field is essential. Admission to the program requires acceptance by the graduate deans and by the participating departments at UCSB and SDSU. Applications from outstanding students in other majors are encouraged, but such students should expect to take additional courses during their first year to improve their background. All students entering the program should have completed a lower and upper division statistics course and the appropriate mathematics and computer science courses for the specialty chosen.

Applications must be received by the Department of Geography not later than February 1 for the Ph.D. program.

Application. Students seeking admission to the joint doctoral program in geography should write directly to the Doctoral Program Coordinator, Department of Geography, SDSU, requesting application materials. A complete application requires that the following information be provided:

The appropriate application form.
Transcripts of academic work already completed.
Graduate Record Examination scores.
Three letters of recommendation.
An essay describing the applicant's purpose in seeking the Ph.D.

A high undergraduate grade point average, normally 3.25 or higher for the last 60 units taken (90 quarter units), and/or a graduate grade point average of 3.50 or higher are required for admission. A minimum combined score of 1100 on the GRE is expected. Scores on both the verbal and quantitative sections of the GRE should exceed the 50th percentile.

Satisfaction of the minimum requirements at San Diego State University or the Department of Geography does not guarantee admission to the doctoral program.

Specific Requirements

Residency Requirements. After formal admission to the joint doctoral program, the student must spend at least one academic year in full-time residence on each of the two campuses. The definition of residence must be in accord with the regulations of UCSB and SDSU. Usually, the first year is spent at SDSU, the second at UCSB, and subsequent years at SDSU.

Advising Committee. Upon admission to the program, the joint doctoral graduate advisers of the two institutions will establish an advising committee for each student. The committee will consist of four faculty members, normally two from each campus, but at least one from UCSB. In consultation with the student, the committee will develop a course of study, including identifying academic deficiencies and recommending remedies for them. The advising committee will be the official advising group for the student until a joint doctoral committee has been chosen and recommended to the Graduate Divisions by the advising committee.

Language Requirement. There is no specific foreign language requirement for this program, but knowledge of a foreign language may be deemed necessary by the advising committee to successfully pursue the student's research goal.

Course Requirements. All students admitted into the joint doctoral program will take common core courses which include: Geography 700 (Seminar in Geographic Research Design) and Geography 701 (Seminar in Development of Geographic Thought). No specified number of courses beyond core courses is required for the doctoral degree. However, students are expected to have a broad understanding of modern geographic principles in addition to a specialist's competence in their own sub-field. In addition, all doctoral students must have computation skills and knowledge of spatial analysis.

Qualifying Examinations

Joint Doctoral Committee. When a doctoral student makes a definitive selection of the systematic area and technique emphasis as well as the general topic of their dissertation research, she/he will select a dissertation supervisor (major professor), who can be from either department but who normally will be a member of the SDSU faculty, and the members of his/her joint doctoral committee. The joint doctoral committee shall be composed of at least four members (with the rank of Assistant Professor or above), two from the SDSU department and two from the UCSB department. The committee may be augmented as needed by an additional member from outside geography at UCSB or a member of the faculty at SDSU from outside of geography or, when authorized, another university. Chaired by the student's major professor, the joint doctoral committee shall be responsible for evaluating the dissertation proposal, administering and evaluating the qualifying examination, judging the dissertation, and administering and evaluating the dissertation defense.

Qualifying Examinations. The process of qualifying to write a Ph.D. dissertation has three steps. First, the student must take a written qualifying examination that normally consists of three portions devoted to: 1) the student's substantive area, 2) her or his technical field(s) of interest, and 3) general geographic thought and inquiry. Second, the student prepares a dissertation proposal that describes the dissertation topic, summarizes the relevant background literature, and presents a comprehensive research plan for the dissertation. Third, the student's doctoral committee will conduct an oral qualifying examination to ensure that the student possesses the full knowledge and competence required to carry out her or his dissertation research. The doctoral committee will assign a pass or fail grade for each examination. Passing the written examination allows the student to proceed to the preparation of the dissertation proposal. The doctoral committee must conditionally approve the dissertation proposal before the student takes the oral qualifying examination. Passing the oral examination signifies that the doctoral dissertation proposal is approved. A student may repeat each examination once.

Upon satisfactory completion of the oral examination and prescribed coursework, the student must make application to the Graduate Dean at UCSB for advancement to candidacy. Upon payment of the candidacy fee to UCSB, and after approval by the graduate deans of both campuses, students will be notified of their advancement to candidacy by the UCSB Graduate Dean.

Dissertation. Following the successful completion of all prescribed coursework and qualifying examinations, the major remaining requirement for the Ph.D. degree will be the satisfactory completion of a dissertation consisting of original research of publishable quality carried out under the guidance of the major professor. Approval of the completed dissertation by the joint

doctoral committee implies that an organized investigation yielding substantial conclusions of interest which expand the frontiers of knowledge and understanding in the discipline has been carried out. Results must be reported in a manner demonstrating the ability of the candidate to effectively prosecute and report independent investigation.

The requirement for completing and filing the dissertation, including the number of copies required, will be decided jointly by the graduate deans and in accordance with regulations of the Graduate Divisions.

Final Examination. The final examination, organized and administered by the joint doctoral committee, shall consist of a dissertation defense, before the joint doctoral committee. Normally, a public lecture will precede this defense.

Award of the Degree. The Doctor of Philosophy degree in geography will be awarded jointly by the Regents of the University of California and the Trustees of The California State University in the names of both institutions.

Financial Support. The Department of Geography at SDSU has a number of research and teaching associateships available to support students admitted to the joint doctoral program. All students applying to admission to the joint doctoral program will be considered for financial support.

Courses Acceptable on Master's and Doctoral Degree Programs in Geography

UPPER DIVISION COURSES

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. Geography of Soils (3) II
Prerequisite: Geography 101.
The nature, properties and distribution of soils and their relationships to the influence of climates, landforms, and human activity. 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) I
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) II
Prerequisite: Geography 103.
The causes of climatic types as they occur throughout the world. Principles of several climatic classifications.

510. Advanced Meteorology (3) II
Prerequisites: Geography 103; Mathematics 121 or 150.
Physical characteristics of the atmosphere including thermodynamics, moisture and condensation, atmospheric aerosol, and cloud processes.

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 201.
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.

560. Environmental Perception and Behavioral Geography (3)
Prerequisite: Geography 102.
Contemporary perceptual and behavioral theories and methods in geography. Problems of empirical research and application in the built and natural environments.

570. Environmental Resource Conservation (3)
Prerequisite: Geography 370.
Management of environmental and natural resources. Effective programs and the institutional frameworks in which they occur.

571. Energy Resources and the Environment (3)
Prerequisite: Geography 370. Recommended: Physics 107 or 301.
Location and distribution of conventional and renewable energy resources, their environmental effects, and policy questions regarding future development and use of energy resources.

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) I
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, II
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.

581. Cartographic Design (3)
Two lectures and three hours of laboratory.
Prerequisite: Geography 381.
Computer-assisted map production techniques with emphasis on map design and color use.

582. Automated Cartography (3)
Two lectures and three hours of laboratory.
Prerequisite: Geography 380, 381, or 484.
Computerized methods of graphically presenting and analyzing spatial data; examination of existing mapping software and digital data sources.

584. Geographic Information Systems Applications (3) II
Two lectures and three hours of laboratory.
Prerequisite: Geography 484, 582, 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, nonobtrusive 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

655. Urban Design and Preservation (3)
Prerequisite: Geography 354.
Major theories of urban form and aesthetics with emphasis on preservation and rehabilitation.

670. Environmental and Resource Conservation Theory (3)
Prerequisite: Graduate standing.
Theories and principles involved in natural and environmental resources management.

682. Advanced Automated Cartography (3)
Prerequisite: Geography 581, 582, or 584.
Computer use for map production and geographic problem solving. Current cartographic research issues and methods.

682L. Advanced Automated Cartography Laboratory (1 or 2)
Three to six hours of laboratory.
Prerequisite: Concurrent registration in Geography 682.
Use of mapping software and digital cartographic data. Research on improving map displays for geographic analysis and communication.

683. Advanced Geographic Information Systems (3)
Prerequisite: Geography 484.
Geographic information systems in geographic problem solving including data structures, project designs, and vector graphics.

683L. Geographic Information Systems Laboratory (1 or 2) II
Three to six hours of laboratory.
Prerequisite: Concurrent registration in Geography 683.
Data processing and analysis in geographic information systems. Applications of overlay functions in spatial analysis.

685. Advanced Quantitative Methods in Geography (3)I
Prerequisite: Geography 585.
Statistical techniques and quantitative models applied to spa–tial problems. Multiple regression, discriminant analysis, factor analysis and spatial modeling.

688. Advanced Remote Sensing (3)
Prerequisite: Geography 588.
Sensor systems, image interpretation and geographic applications in thermal infrared and microwave remote sensing. Principles of digital image processing.

688L. Advanced Remote Sensing Laboratory (1 or 2) II
Two or four hours of laboratory.
Prerequisite: Concurrent registration in Geography 688.
Processing and analysis of remotely sensed data. Laboratory training in sensor systems and digital image-processing methods including thermal infrared and microwave data analysis.

696. Advanced Special Topics in Geography (3)
Prerequisite: Consent of instructor.
Advanced special topics in geography. See Class Schedule for specific content. May be repeated with new content. Maximum combined credit of six units of 596 and 696 applicable to a graduate degree.

700. Seminar in Geographic Research Design (3)

Prerequisite: Graduate standing.

Definition of spatial problems, hypothesis formulation and testing, selection of appropriate methodology. Development of research proposals, conduct of research, written and oral presentations.

701. Seminar in Development of Geographic Thought (3)

Prerequisite: Graduate standing.

Evolution of concepts concerning the nature, scope, theories, and methodologies of geography.

710. Seminar in Physical Geography (3)

Prerequisite: Six units of upper division or graduate level courses in physical geography.

Intensive study of an aspect of physical geography. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

720. Seminar in Regional Geography (3)

Prerequisite: Six units of upper division or graduate level courses in the topical area under consideration.

Intensive study of a spatial system using the regional content or regionalization methods. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

740. Seminar in Human Geography (3)

Prerequisite: Six units of upper division or graduate level courses in human geography.

Intensive study of a spatial aspect of human geography. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

760. Seminar in Behavioral and Social Geography (3) II

Prerequisite: Six units of upper division or graduate level courses in behavioral or social geography.

Intensive study of a spatial aspect of behavioral or social geography. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

770. Seminar in Environmental and Resource Conservation (3)

Prerequisites: Geography 670 and six units of upper division or graduate level courses in environmental or resource conservation.

Natural and environmental resource conservation. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

780. Seminar in Techniques of Spatial Analysis (3)

Prerequisite: Six units of upper division or graduate level courses in spatial analytic techniques.

Spatial analytic techniques from image processing, remote sensing, geographic information systems, cartography or quantitative methods. May be repeated with new content. See Class Schedule for specific content. Maximum credit six units applicable to a master's degree.

797. Research (1-3) Cr/NC/SP

Research in one of the fields of geography. Maximum credit six units applicable to a master's degree.

798. Special Study (1-3) Cr/NC/SP

Prerequisite: Consent of staff; to be arranged with department chair and instructor.

Individual study. Maximum credit six units applicable to a master's degree.

799A. Thesis (3) Cr/NC/SP

Prerequisites: An officially appointed thesis committee and advancement to candidacy.

Preparation of a project or thesis for the master's degree.

799B. Thesis Extension (0) Cr/NC

Prerequisite: Prior registration in Thesis 799A with an assigned grade symbol of SP.

Registration required in any semester or term following assignment of SP in Course 799A in which the student expects to use the facilities and resources of the university; also student must be registered in the course when the completed thesis is granted final approval.

890. Independent Study for Doctoral Examination (1-9)

Prerequisite: Consent of instructor or graduate adviser.

Tutorial with student's major professor in preparation for qualifying examinations. No unit credit allowed toward advanced degree. Maximum credit nine units.

897. Doctoral Research (1-6)

Prerequisite: Admission to the doctoral program.

Independent investigation in the general field of the dissertation. A written proposal must be approved by the joint doctoral advising committee. Maximum credit six units applicable to a doctoral degree.

899. Doctoral Dissertation (1-6)

Prerequisites: Advancement to candidacy and an officially constituted dissertation committee.

Preparation of the dissertation for the doctoral degree. Enrollment is required during the term in which the dissertation is approved. No unit credit allowed toward advanced degree.