

GEOGRAPHY

College of Liberal Arts

Department Chair: Paul Laris

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Faculty: Hyowon Ban, James R. Curtis, Suzanne Dallman, Christine L. Jocoy, Paul Laris, Christopher T. Lee, Jacqueline Mills, Christine M. Rodrigue, Dmitrii Sidorov, Deborah Thien, Suzanne P. Wechsler

Advisors:

Undergraduate: Suzanne Dallman

Graduate: Deborah Thien

Administrative Support Coordinator: Magdalena Munoz

Students desiring information should contact the department office for referral to one of the faculty advisors.

Career Possibilities

Urban Planner • Cartographer • Computer Mapping
• Regional, Urban and Environmental Planner •
Natural Resources Manager • Environmental Monitor •
Transportation Planner • Travel Counselor/Agent • Real
Estate Appraiser • Environmental Analyst • Intelligence
Analyst • Marketing Analyst • Community Development
Specialist • Demographer • Recreation Resource Planner
• Industrial Development Specialist • GIS Specialist •
Climatologist • Ecologist • Environmental Impact Report
Writer • Teacher

Introduction

Geography focuses on the spatial organization of human and physical landscapes, the interactions between human society and the physical environment, as well as on the meanings that people bring to their place in the world.

The Department offers the Bachelor of Arts and Master of Arts degrees, Geography Minor, and two certificates. For further information, go to the department or visit <http://www.csulb.edu/colleges/cla/departments/geography>. For the Master of Arts degree in Geography, candidates are responsible for the general requirements stated in this catalog as well as the specific departmental requirements contained in the Geography Master of Arts Handbook.

Undergraduate Programs

Bachelor of Arts in Geography (120 units)

Requirements

A grade of "C" or better must be achieved in all upper division Geography courses. The Geography major requires at least 39 units of which at least 9 must be at the 400 level. Lower Division (12 units):

Take all of the following courses:

GEOG 200 Introduction to Research Methods for Geographers (3)
Prerequisite: None

GEOG 280 Intro Geospatial Techniques (3)

Prerequisite: None

Take one of the following courses:

GEOG 130 Introduction to Climatology (4)

Prerequisite: One G.E. Foundation course (One B.2. and one A.1 course recommended)

GEOG 140 Introduction to Physical Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Take one of the following courses:

GEOG 100 World Regional Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course

GEOG 120 Geography of Human Diversity in U.S. (3)

Prerequisite/Corequisite: One G.E. Foundation course.

GEOG 160 Introduction to Human Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Upper Division (27 units)

Take all of the following courses:

GEOG 340 Environmental Geography (3)

Prerequisite: GEOG 130 or 140 or GEOL 280.

GEOG 360 Human Geography (3)

Prerequisites: GEOG 100, 120, or 160.

GEOG 380 Map Interpretation and Analysis (3)

Prerequisite: None

Take one Regional course (see list below)

Take 3 courses in one of the following concentrations:

Environmental/Physical Geography, Human Geography, Geospatial Techniques, or Global/Regional Studies

Major Concentrations

Students are urged to complete courses in each cluster and to seek the advice of the undergraduate advisor and other faculty to identify courses that are best suited to meet their educational and career objectives. In addition, programs may be tailored to meet the needs of individual students especially those choosing to double-major.

Environmental/Physical Geography:

GEOG 355I, 440, 442, 443, 444, 445, 447, 448, 455, 458, 481.

Human Geography:

GEOG 301I, 319I, 352, 357I, 402, 446, 452, 460, 462 (also WGSS 462), 464, 465, 467, 468, 470, 471 (also HCA 471).

Geospatial Techniques:

GEOG 400, 402, 473, 474, 475, 482, 484, 485, 486, 487A, 487B, 488.

Global and Regional Studies:

Global Studies Courses:

GEOG 319I, 352, 355I, 452, 460, 464, 468, 470.

Regional Courses:

GEOG 304, 306, 308I, 309I, 313I, 314I, 315I, 316, 318, 321, 322

Additional Courses

The following courses may be included in the above concentrations with approval of the Undergraduate Advisor:
GEOG 492, 494, 497.

Minor in Geography

The Minor in Geography is available to any non-Geography major. Requires a minimum of 18 units.

Take one of the following courses:

GEOG 130 Introduction to Climatology (4)
Prerequisite: One G.E. Foundation course (One B.2. and one A.1 course recommended)

GEOG 140 Introduction to Physical Geography (3)
Prerequisite/Corequisite: One G.E. Foundation course.

Take one of the following courses:

GEOG 100 World Regional Geography (3)
Prerequisite/Corequisite: One G.E. Foundation course

GEOG 120 Geography of Human Diversity in U.S. (3)
Prerequisite/Corequisite: One G.E. Foundation course.

GEOG 160 Introduction to Human Geography (3)
Prerequisite/Corequisite: One G.E. Foundation course.

Take one of the following courses:

GEOG 280 Intro Geospatial Techniques (3)
Prerequisite: None

GEOG 380 Map Interpretation and Analysis (3)
Prerequisite: None

Take at least 9 units of upper division courses with at least one course selected from the 400 series.

Certificate in Geographic Information Science

Co-Directors: Christopher Lee, Suzanne Wechsler

This certificate provides experience in quantitative spatial analysis using Geographic Information Systems, working with remotely sensed imagery and field-derived data, and effective communication through maps. The certificate serves as a supplement to standard degree programs. A brochure describing the GIScience Certificate is available in the department or on-line at www.csulb.edu/geography.

This certificate program is eligible for Financial Aid. Please see the department web site for required Federal disclosure information.

Requirements

1. A bachelor's degree, which may be earned concurrently.
2. Consultation with the certificate advisor in the Geography Department.
3. Satisfactory completion of prerequisites (9 units):
 - GEOG 200 Introduction to Research Methods for Geographers (3)
Prerequisite: None
 - GEOG 280 Intro Geospatial Techniques (3)
Prerequisite: None
 - GEOG 380 Map Interpretation and Analysis (3)
Prerequisite: None
4. A minimum of 23 units distributed as follows:
 - A. Core Courses. Take all the following courses:
 - GEOG 400 Geographical Analysis (4)
Prerequisite: GEOG 200 or any introductory statistics course or consent of instructor.
 - GEOG 473 Remote Sensing (4)
Prerequisites: GEOG 200 (or equivalent) and GEOG 280 or consent of instructor.
 - GEOG 485/585 Principles of Geographic Information Science (4)
Prerequisites: GEOG 200 or equivalent and GEOG 280; or consent of instructor.

B. Specialization (three courses):

Students are encouraged to select a specialization in one of the following three areas, although courses can be selected between categories with advisor approval.

Geographic Information Systems:

GEOG 487A/587A, 487B/587B, 488/588

Remote Sensing: GEOG 474, 475

Cartography: GEOG 482, 484/584

The following courses may be substituted for the above courses with advisor consent: GEOG 481, 492, 494, 497, 697, 680. Substitutions may also be made for courses in database, computer programming, surveying and/or web design and visualization with approval from the Certificate Advisor.

Certificate in Urban Studies

The Urban Studies Certificate, housed in the Department of Geography, takes an interdisciplinary approach. Students take a core of courses in Geography and take courses from one of two concentrations (Urban Theory and Practice or Applied Urban Geography). For further information, go to www.csulb.edu/geography.

This certificate program is eligible for Financial Aid. Please see the department web site for required Federal disclosure information.

Requirements

1. A bachelor's degree, which may be earned concurrently.
 2. Consultation with the undergraduate advisor in the Geography Department.
 3. A minimum of 23 units distributed as follows:
 - Core requirements (6 units):
Take the following courses:
 - GEOG 301I The Urban Scene (3)
Prerequisites: GE Foundation requirement, one or more Exploration courses, and upper division standing.
 - GEOG 464 Urban Geography (3)
Prerequisite: GEOG 100, 120, or 160 or consent of instructor; GEOG 360 recommended.
 - Concentration Requirement (minimum 17 units)
Choose One Option:
 - Concentration A - Applied Urban Geography:* GEOG 446, 467, 485*, 487B; and one of the following: ASAM 435; CHLS 470I, CAFF 322, 422; GEOG 471 or HCA 471.
 - Concentration B - Urban Theory and Practice:* Take six of the following courses: GEOG 467, 468; HIST 469, 474I; ANTH 416; POSC 327; CHLS 421; WGSS 432; DESN 367.
- *Students must also take GEOG 280 before enrolling in this course. This course is a prerequisite and does not count toward the Certificate.

Graduate Programs

Master of Arts in Geography

Prerequisites

1. A bachelor's degree in geography; or,
2. A bachelor's degree with 24 units of upper division courses substantially equivalent to those required for a geography major at this University; or,
3. A bachelor's degree in a related discipline with 24 units of upper division courses in a combination of geography and approved courses in related disciplines,

4. Completion of introductory methods course,
5. An undergraduate GPA of 3.0 ("B") or better in geography, or alternative evidence of ability to do graduate work,
6. Completion of Graduate Record Examination (GRE),
7. File with the department a declaration of intent to seek the master's degree in geography.

Advancement to Candidacy

1. See the Geography Graduate Student Handbook;
2. See the general University requirements.

Requirements

1. Completion of courses required to remove foundational and prerequisite deficiencies (see prerequisites above),
2. Fulfillment of the Graduation Writing Assessment Requirement (GWAR),
3. Completion of 30 units of approved upper division and graduate courses. A minimum of 24 units of Geography courses. A minimum of 18 units of 500 and 600-level courses

Take the following two courses:

GEOG 596 Geographic Thought and Literature (3)
Prerequisite: Consent of instructor.

GEOG 696 Seminar in Geographical Research
Methods (3)
Prerequisites: GEOG 596, graduate standing in geography, and consent instructor.

Take one advanced geographic methods course, approved by the Thesis Advisory Committee Chair, from the following:

GEOG 400 Geographical Analysis (4)
Prerequisite: GEOG 200 or any introductory statistics course or consent of instructor.

GEOG 474 Intro to Digital Image Processing (4)
Prerequisite: GEOG 473 or consent of instructor.

GEOG 502 Qualitative Geographic Analysis (4)
Prerequisite: GEOG 360 or consent of instructor.

GEOG 575 Geographical Applications in Remote Sensing (4)
Prerequisites: GEOG 140, 160, 473, and 474.

GEOG 584 Advanced Concepts in Presentation Cartography (4)
Prerequisite: GEOG 482 or consent of instructor.

GEOG 586 Field Methods in Landscape Analysis (4)
Prerequisite: GEOG 340 or consent of instructor.

GEOG 587A Applications of GIS: Environment and Natural Resources (4)
Prerequisites: GEOG 485 or 585 or consent of instructor.

GEOG 587B Applications of Geographic Information Science: Urban and Economic (4)
Prerequisite: GEOG 485 or 585 or consent of instructor.

GEOG 588 Advanced Topics in GIS (4)
Prerequisites: GEOG 485/585 and one of the following: 487A/587A, 487B/587B, 482, 484; or consent of instructor.

Take 2 topical seminars (each of the following seminars may be taken with credit twice to meet this requirement), from the following:

GEOG 640 Seminar in Physical Geography (3)
Prerequisite: Consent of instructor.

GEOG 650 Seminar in Cultural Geography (3)
Prerequisite: Consent of instructor.

GEOG 666 Seminar in Urban Geography (3)
Prerequisite: Consent of instructor.

GEOG 680 Seminar in Geospatial Science (3)
Prerequisite: Consent of instructor.

Take 6 units of thesis:

GEOG 698 Thesis (6)
Prerequisite: Consent of instructor.

4. A "B" or better in two core courses:

GEOG 596 Geographic Thought and Literature (3)
Prerequisite: Consent of instructor.

GEOG 696 Seminar in Geographical Research
Methods (3)

Prerequisites: GEOG 596, graduate standing in geography, and consent instructor.

General

492. Internship in Applied Geography
494. Selected Topics in Geography
497. Directed Studies

Global and Regional

GLOBAL:

- 319I. International Development
352. Geography of Travel and Tourism
355I. International Environmental Issues
452. Geography of the Global Economy
468. World Cities/Cities of the World
470. Political Geography

REGIONAL:

100. World Regional Geography
304. California
306. United States and Canada
308I. Africa South of the Sahara
309I. The Middle East and North Africa
313I. Southeast Asia
314I. South Asia
315I. East Asia
316. Europe
318. Russia and Its Neighbors
321. Geography of Mexico, Central America and the Caribbean
322. Geography of South America

Human Geography

120. Geography of Human Diversity in the United States
160. Introduction to Human Geography
301I. Urban Life and Problems
319I. International Development
352. Geography of Travel and Tourism
357I. Sacred Geographies
360. Human Geography
381. Maps and Civilization
446. Land Use Planning
452. Geography of the Global Economy
460. Population Geography
462. Feminist Geography
464. Urban Geography
465./565. Social Geography
467./567. Urban Geography: Metropolitan Problems
468. World Cities/Cities of the World
470. Political Geography
471. Geographic Information Science (GIS) for Health

Environmental/Physical Geography

130. Introduction to Climatology
140. Introduction to Physical Geography
340. Environmental Geography
355I. International Environmental Issues
440./540. Land and Water Environments
442. Biogeography
443. Watersheds: Processes and Management
444. Climatology
445. Palaeoclimatology
447. Landscape Restoration
448. Environmental Assessment
455. People As Agents of Environmental Change
458./558. Hazards and Risk Management
481. Geographic Information Science for Natural Sciences

Methods and Techniques

These courses develop skills in graphic and statistical communication and field analysis which are used within the various sub-fields of the discipline.

200. Introduction to Research Methods for Geographers
280. Introduction to Geospatial Techniques
380. Map Interpretation and Analysis
400. Geographical Analysis
402. Qualitative Geographic Analysis
482. Thematic Map Design for Presentation and GIS
473. Remote Sensing
474. Introduction to Digital Image Processing
475. Geographical Application Remote Sensing
484./584. Advanced Concepts in Presentation Cartography
485./585. Introduction to Geographic Information Systems
486. Field Methods in Landscape Analysis
487A./587A. Applications of GIS: Environment and Natural Resources
487B./587B. Applications of GIS: Urban and Economic
488. Geographic Information Systems

Geography Courses (GEOG)

LOWER DIVISION

100. World Regional Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Through a spatial approach, introduction to the world's geographic realms and examination of their cultural, population and political dynamics, resources and economic development, patterns of settlement and environmental elements.

120. Geography of Human Diversity in the United States (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Examines America's Human Diversity from a geographic perspective focusing on the spatial distribution and organization of race/ethnicity and gender/sexuality groups across the U.S.'s rural and urban cultural landscapes while emphasizing the spatial politics of inclusion and exclusion.

130. Introduction to Climatology (4)

Prerequisite: One G.E. Foundation course (One B.2. and one A.1 course recommended)

Introduction to Earth's atmosphere, weather processes, global climate patterns, drivers of climate change and their interactions with the biotic and abiotic environment. Analysis of how human

activities affect weather and climate processes and the patterns of global climate impacts.

Letter grade only (A-F). (3 hours lecture, 2 hours field activity)

140. Introduction to Physical Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Systematic study of the physical environment including human-environmental interaction, environmental hazards, and natural resources.

160. Introduction to Human Geography (3)

Prerequisite/Corequisite: One G.E. Foundation course.

Geographic aspects of culture, including the past and present social, political and economic factors that are related to human perception, organization and use of the environment.

200. Introduction to Research Methods for Geographers (3)

Introduction to the scientific method in geography, with an emphasis on basic quantitative and qualitative techniques and their applications.

Not open for credit to student with credit in first course in statistics. (2 hours lecture, 2 hours laboratory).

250. Early World Historical Geography (4)

Prerequisites: Open only to Integrated Teacher Education Program (ITEP) students.

Emergence and changing nature of urban life, cultural and technological diffusions, and variations in the intensity of contact and exchange among cultures and civilizations over time. Geographic and historical factors, such as location and place, human/environment interactions, migrations, and diffusion.

Same course as HIST 250. Not open for credit to students with credit in HIST 250.

280. Introduction to Geospatial Techniques (3)

Introduction to geospatial techniques, which include geographic information science (GIS), cartography, global positioning systems (GPS), and remote sensing. Students will be introduced to the geographic concepts required for spatial analysis.

(3 hours lecture)

UPPER DIVISION

General Education Category A must be completed prior to taking any upper division course.

301I. The Urban Scene (3)

Prerequisites: GE Foundation requirement, one or more Exploration courses, and upper division standing.

Analysis of urban life-styles; land use and design; population trends; conflicts in the increasingly multicultural urban setting; housing and community development; suburban-central city relationships; human utilization of urban life spaces; opinions of landmark urbanists; and future trends.

Same course as U/ST 301I. Not open for credit to students with credit in U/ST 301I or SOC 419.

304. California (3)

California's diverse natural and cultural environment with emphasis upon social and economic problems and the human response to environmental hazards.

306. United States and Canada (3)

Prerequisites: GE Foundation requirement.

Common social, economic and political interests of the major human use regions of the United States and Canada. Describes and interprets the culture patterns of each region in relation to the natural settings in which they have developed.

Geography Courses (GEOG)

308I. Africa South of the Sahara (3)

Prerequisites: GE Foundation requirement, one or more Explorations courses, and upper-division standing.

Human and environmental settings of Africa South of Sahara and the ecological, cultural, demographic, economic settlement and political relationships that characterize them.

309I. The Middle East and North Africa (3)

Prerequisites: GE Foundation requirement, one or more Explorations courses, and upper-division standing.

Human and physical settings of the Middle East and North Africa and the cultural, economic, settlement, and political relationships that characterize them stressing those factors which underlie the region's instability and global importance.

313I. Southeast Asia (3)

Prerequisites: GE Foundation requirement, one or more Exploration courses and upper division standing.

Cross-cultural examination of the characteristics and problems found across Southeast Asia, specifically, environmental and cultural patterns, historical development of the spatial organization of society, demographic and other dynamics of social change, and issues of socio-economic and political development.

Letter grade only (A-F).

314I. South Asia (3)

Prerequisites: GE Foundation requirement, one or more Exploration courses and upper division standing.

Cross-cultural examination of the various characteristics and problems found across the region of South Asia. Specific foci are environmental and cultural patterns, the historical development of the spatial organization of society, demographic and other dynamics of social change related to issues of socio-economic and political development.

Letter grade only (A-F).

315I. East Asia (3)

Prerequisites: GE Foundation requirement, one or more Exploration courses and upper division standing.

Cross-cultural examination of the characteristics and problems found across East Asia, specifically, environmental and cultural patterns, historical development of the spatial organization of society, demographic and other dynamics of social change, and issues of socio-economic and political development.

Letter grade only (A-F).

316. Europe (3)

Prerequisites: GE Foundation requirement.

The human and physical patterns of Europe. Current cultural conditions and environmental problems.

318. Russia and Its Neighbors (3)

Prerequisite: GE Foundation requirement.

Systematic and regional study of the physical, economic and cultural geography of the countries of the former Soviet Union.

319I. International Development (3)

Prerequisites: GE Foundation requirement, one Explorations course, upper-division standing.

Theoretical and practical analysis of social, political, and economic development and alternative developmental models. Contemporary and historical comparisons of how "developed" and "developing" areas of the world have confronted various economic, social, and political challenges.

Same course as I/ST 319I. Not open for credit to students with credit in I/ST 319I.

321. Geography of Mexico, Central America and the Caribbean (3)

Prerequisites: GE Foundation requirements.

Examines Mexico, Central America and the Caribbean from a regional geographical perspective. Utilizing both historical and contemporary points of view, it identifies and interprets the distinguishing environmental, demographic, cultural, social, economic, and geopolitical characteristics of the region.

Not open to students who have taken GEOG 320I. Letter grade only (A-F).

322. Geography of South America (3)

Prerequisites: GE Foundation requirements.

Examines South American from a regional geographical perspective. Utilizing both historical and contemporary points of view, it identifies and interprets the distinguishing environmental, demographic, cultural, social, economic, and geopolitical characteristics of the region.

Not open for credit to students who have credit in GEOG 320I. Letter grade only (A-F).

340. Environmental Geography (3)

Prerequisite: GEOG 130 or GEOG 140 or GEOL 280.

Examines interrelationships between society and land and water environments. Focuses on critical analysis of contemporary environmental issues in American West, including both physical and human factors.

Letter grade only (A-F).

352. Geography of Travel and Tourism (3)

Historical and contemporary spatial characteristics and dimensions of tourism activity. Tourism, destinations, travel patterns, environmental and economic impacts, and analysis of regional tourism patterns.

355I. International Environmental Issues (3)

Prerequisites: GE Foundation requirement, one Explorations course, and upper division standing.

Examines the deterioration, destruction, maintenance and restoration of environmental systems and resources. Identifies and analyzes major environmental problems that have international dimensions. Investigates ongoing and potential efforts to resolve them.

Same course as I/ST355I. Not open for credit to students with credit in I/ST 355I.

357I. Sacred Geographies (3)

Prerequisites: Completion of GE Foundation, one or more Exploration courses and upper division status.

Comparative exploration of sacred spaces across the world. Examines the social, political, and religious processes that create places of ritual and reverence by linking the individual to the communal experience of place.

Letter grade only (A-F).

360. Human Geography (3)

Prerequisites: GEOG 100, 120, or 160.

Introduces breadth of research across subfields of human geography through examination of various contemporary topics, such as migration, globalization, cultural landscapes, urbanization, politics, agricultural practices, and development.

Letter grade only (A-F).

380. Map Interpretation and Analysis (3)

Interpretation and understanding of maps as graphic communication with emphasis on critical analysis, symbolization, scale, projection.

(Lecture, problems 3 hours)

381. Maps and Civilization (3)

Maps and Civilization examines the role maps play in different cultures. Drawing upon the disciplines of cartography, geography, history, art, and science, it explores maps in Western and non-

Western cultures; conventional and alternative cartographies; and mapping activities of men and women.

Letter grade only (A-F).

400. Geographical Analysis (4)

Prerequisite: GEOG 200 or any introductory statistics course or consent of instructor.

Examination of advanced quantitative techniques employed by geographers in analysis of spatial phenomena. Topics covered include multivariate statistical methods as models for geographical analysis. Emphasis on the application of these techniques in geographical research, using statistical software.

(3 hours seminar and 2 hours laboratory).

402. Qualitative Geographic Analysis (4)

Prerequisite: GEOG 360 or consent of instructor.

Examines qualitative geographic methodologies and methods through the theoretical frameworks that geographers employ in their research. Introduces survey, interview, and focus group techniques, textual analysis, participant observation, and ethnography. Includes a hands-on research experience.

(4 hours discussion). Letter grade only (A-F).

440./540. Land and Water Resources (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Examines interrelationships between land and water as components of the human environment. Focus is on management, use and human impacts, with an emphasis on water resources.

Letter grade only (A-F). (Lecture-discussion)

441./541. The Geography of Mars (4)

Prerequisite/Corequisite: GEOG 130 or 140 or GEOL 102 and GEOG 280 or consent of instructor.

Introduction to the geography of Mars, providing a physical regionalization of the Martian surface and climate and an understanding of underlying tectonic, geomorphic, and meteorological processes. The course reviews remote sensing fundamentals and data sources for geographical analysis of Mars.

Letter grade only (A-F). (3 hours seminar, 2 hours activity).

442. Biogeography (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Theories and methods of mapping plant and animal distributions, spatial interaction of species with environmental limiting factors, and the human role in temporal and spatial variation of ecosystems.

Letter grade only (A-F). (Lec-problems; field experience)

443. Watersheds: Processes and Management (4)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Basic principles of watershed hydrology, including hydrologic processes, runoff behavior, precipitation patterns and watershed models. Evaluation of water quality elements such as nonpoint source pollution. Laboratory and field exercises will include hydrologic data collection, processing and evaluation.

Letter grade only (A-F). (3 hours Lecture, 2 hours Laboratory)

444. Climatology (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Descriptive and explanatory analysis of elements and controls of climate. Climates of world emphasis on California and North America.

Letter grade only (A-F). (Lecture, problems 3 hours)

445. Palaeoclimatology (4)

Prerequisites: ESP 200 or GEOG 340 and GEOG 200 (or equivalent) or consent of instructor.

Methods and theories used in reconstructing and dating climates of the past 2 million years, using such proxies as sediment sequences, packrat middens, ice cores, tree rings, corals, and documentary data. Causes of environmental change and human interactions are analyzed.

Letter grade only (A-F). (Lecture 3 hours, lab activities 2 hours)

446. Land Use Planning (3)

Examines land use planning, issues and responses concerning land use; coastal zones; environmental resource management; urban growth; design and aesthetics; planning parameters for residences, parks, conservation areas, shopping centers, and industrial areas; urban and regional revitalization, and transportation.

Not open for credit to students with credit in U/ST 446

447. Landscape Restoration (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Explores philosophical, political, and ecological issues associated with restoring degraded landscapes. Analysis of theoretical works, scientific research, planning documents and case studies. Examines potential for restoring natural landscapes.

Letter grade only (A-F).

448./548. Environmental Assessment (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Introduction to the policy framework and techniques for assessing impacts on various aspects of the biological and physical environment. The course is a survey of multiple topics involving various types of environmental assessment, including data collection, processing and evaluation.

Letter grade only (A-F). (Undergraduates register in GEOG 448; graduates register in 548.) (3 hours lecture, activity)

452. Geography of the Global Economy (3)

Prerequisite: GEOG 360 or consent of instructor.

Examines globalization processes that create integration of world's economic, political, and cultural systems, but operate unevenly across space and time. Focuses on impact on people and places around the world.

(Lecture, problems) Letter grade only (A-F).

455. People As Agents of Environmental Change (3)

Prerequisite: GEOG 340 or consent of instructor.

Examines human impact on biophysical environment from long-term and global perspective. Explores regional and global implications of these changes on people and environments. Examines different theories for explaining major human forces that drive environmental change.

Letter grade only (A-F). (Lecture 3 hours)

458./558. Hazards and Risk Management (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Broad overview of hazards and disasters, whether natural or technological, emphasizing the physical and social dynamics that interact to produce hazard, the spatial and temporal distributions of various hazards, and policy options for disaster preparation, loss reduction, and community resilience.

Letter grade only (A-F).

460. Population Geography (3)

Prerequisite: GEOG 360 or consent of instructor.

Introduction to geographic study of population. Includes growth and distribution of world population; results of changing births, deaths, and migration; variations in population composition; related problems such as food supplies and environmental deterioration.

Letter grade only (A-F).

462. Feminist Geography (3)

Prerequisite: GEOG 360 or consent of instructor.

An introduction to feminist geography. Critically engage with international research on topics such as geographies of emotion, care and health; femininities and masculinities; feminist post-structural theories and philosophies; and feminist methodological approaches to geographical research.

Letter grade only (A-F). Same course as WGSS 462. Not open for credit to students with credit in WGSS 462

Geography Courses (GEOG)

464. Urban Geography (3)

Prerequisite: GEOG 100, 120, or 160 or consent of instructor; GEOG 360 recommended.

Examines the theories, concepts, and techniques that geographers use to explain the origin, growth, functions, and character of cities, including their location, internal organization, economic functions, transportation systems, social and cultural processes, and built and physical environments.

Not open for credit for students with credit in GEOG 366. Letter grade only (A-F).

465./565. Social Geography (3)

Prerequisite: GEOG 360 or consent of instructor.

The geographies of society, including various methodological and theoretical approaches to social geography. Topics may include socio-spatial inequality, crime, housing, religious systems, medical and health geography, feminist geography, the geography of sexuality, the geography of race, or poststructuralist geography.

Letter grade only (A-F).

467./567. Urban Geography: Metropolitan Problems (3)

Prerequisite: GEOG 360 or consent of instructor.

Geographic components of metropolitan problems and their solutions. Problems related to transportation systems, housing, evolution of ghettos, urban perception and behavioral patterns will be discussed in terms of theoretical and practically applied urban planning solutions.

Letter grade only (A-F). (Lecture, problems 3 hrs)

468. World Cities/Cities of the World (3)

Prerequisite: GEOG 360 or consent of instructor.

Comparative examination of major world cities within the context of their regional and national urban systems. Compares and contrasts cities of developed and developing worlds. Explores divergent urbanization patterns and world city development in major cultural realms.

Letter grade only (A-F).

470. Political Geography (3)

Prerequisite: GEOG 360 or consent of instructor.

Comparative study of the earth's politically organized regions and related systems. Varied approaches are explored, such as power analysis, genetic analysis, and functional analysis of political units. Stresses political geographic concepts used in analyzing the viability of states and nations.

Letter grade only (A-F). (Lecture, problems)

471. Geographic Information Science (GIS) For Health (3)

Prerequisite: GEOG 200 or SOC 250 or equivalent.

An Introduction to the fundamentals of Geographic Information Science and systems (GIS) including concepts and skills in spatial reasoning and spatial thinking. Explores GIS in spatial query, problem analysis and decision support using health-related applications. Lecture/discussion and Laboratory (2 hours seminar, 2 hours computer laboratory)

Letter grade only (A-F). Same course as HCA 471. Not open for credit to students with credit in HCA 471.

473. Remote Sensing (4)

Prerequisites GEOG 200 (or equivalent) and GEOG 280 or consent of instructor.

Processing and interpretation of aerial photographs and digital satellite imagery. Topics include the electromagnetic spectrum, energy-matter interactions, sensor characteristics, and the acquisition, processing and interpretation of imagery for

applications including the analysis of vegetation dynamics, surface hydrology and urban environments.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

474. Introduction to Digital Image Processing (4)

Prerequisite: GEOG 473 or consent of instructor.

Provides a background to the principles and concepts of digital image processing and the extraction of information from digital satellite data with focus various enhancement and extraction techniques, specifically, within the visible and near-infrared portions of the electromagnetic spectrum.

Letter grade only (A-F). (Seminar 3 hours; Laboratory 2 hours).

475. Geographical Applications in Remote Sensing (4)

Prerequisites: GEOG 140, 160, 473, and 474.

Focuses on remote sensing applications. Students will be introduced to sophisticated imagery and analysis techniques, as applied to weather and fire modeling, arid lands environmental problems, or the urban environment.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

481. Geographic Information Science for Natural Sciences (4)

Prerequisites: Junior/Senior/Graduate standing; GEOG 140 or BIOL 153 or GEOL 102.

Introduces fundamentals of geographic information science and systems (GIS) to non-geography students, including concepts and skills in spatial reasoning and spatial thinking. Explores GIS in spatial query, problem analysis and decision support, using biologic, geologic, and ecologic applications.

(2 hours of seminar, 2 hours of computer laboratory)

482. Map Design for Presentation and GIS (4)

Prerequisites: GEOG 200 or equivalent and 380 or consent of instructor.

Theory and techniques in the creation of thematic maps including design, generalization, and symbolization, with an emphasis on computer presentation methods.

(Seminar 3 hours, laboratory 2 hours).

484./584. Advanced Concepts in Presentation Cartography (4)

Prerequisite: GEOG 482 or consent of instructor.

Advanced theory and techniques for presentation cartography including communication, visualization, terrain representation, animation, and color.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

485./585. Principles of Geographic Information Science (4)

Prerequisites: GEOG 200 or equivalent and GEOG 280; or consent of instructor.

Fundamental concepts and techniques of geographic information systems and science are introduced. Emphasizes spatial analyses to address spatial questions.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

486. Field Methods in Landscape Analysis (4)

Prerequisite: GEOG 340 or consent of instructor.

Introduction to field techniques, including formulation of field plans, recording direct observation, field mapping, sampling techniques, interviewing, and organizing and evaluating data for presentation.

Letter grade only (A-F). (Lecture-discussion 1 hour, supervised field work 6 hours)

487A. Applications of Geographic Information Science (GIS): Environment and Natural Resources (4)

Prerequisites: GEOG 485 or 585 or consent of instructor.

Use of Geographic Information Systems and science for spatial query, problem analysis, spatial modeling and decision support in

natural resource assessment. Students with background in GIS are introduced to environmental applications. Emphasizes use of raster GIS.

(3 hours Lecture, 2 hours Laboratory)

487B. Applications of Geographic Information Science (GIS): Urban and Economic (4)

Prerequisites: GEOG 485 or 585 or consent of instructor.

Builds on introductory knowledge of Geographic Information Systems, spatial analysis and spatial data and focuses on urban and economic applications and analyses.

(3 hours Lecture, 2 hours Laboratory)

488./588. Advanced Topics in Geographic Information Science (4)

Prerequisites: GEOG 485 and one of the following: GEOG 487A, 487B, 482, 484; or consent of instructor.

Advanced concepts in geographic information systems and techniques are introduced and their applications in geography and related disciplines explored.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

492. Internship in Applied Geography (3)

Prerequisites: Geography major with upper division or graduate standing, prior geography coursework or equivalent recommended, and consent of instructor.

Community-based placement to enhance professional preparation in applied geography.

May be repeated to a maximum of 6 units; a second semester experience shall differ substantially from first semester experience. Undergraduates may elect Credit/No Credit or letter grading; letter grading only is required for graduate students. Student will work under faculty supervision.

494. Selected Topics in Geography (1-3)

Prerequisite: Consent of instructor.

Application of geographical concepts and methodology to selected contemporary problems.

May be repeated to a maximum of 6 units with consent of department chair. Topics announced in the *Schedule of Classes*. May not be credited toward the major in geography without written department consent in advance of enrollment.

495. Field Training in Geospatial Techniques (1-6)

Prerequisites: GEOG 140, 473, 485 or consent of instructor

In this advanced applied geography course students will enhance their knowledge of geospatial techniques (geographic information science, remote sensing) and apply these skills to address geographic and spatial questions through a combination of intense hands-on field work and data analyses.

Letter grade only (A-F). (3 - 18 hours Activity)

497. Directed Studies (1-3)

Prerequisite: Consent of instructor.

Individually directed studies of special problems in geography.

May be repeated to a maximum of 6 units with consent of department chairperson. May not be credited toward the major in geography without written department consent in advance of enrollment.

GRADUATE LEVEL

500. Multivariate Geographical Analysis (4)

Prerequisites: GEOG 200 or any introductory statistics course or consent of instructor.

Examination of advanced multivariate statistical techniques employed by geographers in analysis of spatial phenomena. Emphasis on applications in geographical research, using spreadsheet and statistical software.

Letter grade only (A-F). (3 hours seminar, 2 hours laboratory)

502. Qualitative Geographic Analysis (4)

Prerequisite: GEOG 360 or consent of instructor.

Examines qualitative geographic methodologies and methods through the theoretical frameworks that geographers employ in their research. Introduces survey, interview, and focus group techniques, textual analysis, participant observation, and ethnography. Includes a hands-on research experience.

(4 hours discussion). Letter grade only (A-F).

540./440. Land and Water Resources (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Examines interrelationships between land and water as components of the human environment. Focus is on management, use and human impacts, with an emphasis on water resources.

Letter grade only (A-F). (Lecture-discussion)

541./441. The Geography of Mars (4)

Prerequisite/Corequisite: GEOG 130 or 140 or GEOL 102 and GEOG 280 or consent of instructor, and graduate student standing.

Introduction to the geography of Mars, providing a physical regionalization of the Martian surface and climate and an understanding of underlying tectonic, geomorphic, and meteorological processes. The course reviews remote sensing fundamentals and data sources for geographical analysis of Mars.

Letter grade only (A-F). (3 hours seminar, 2 hours activity)

543. Watersheds: Processes and Management (4)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Basic principles of watershed hydrology, including hydrologic processes, runoff behavior, precipitation patterns and watershed models. Evaluation of water quality elements such as nonpoint source pollution. Laboratory and field exercises will include hydrologic data collection, processing and evaluation.

Letter grade only (A-F). (3 hours Lecture, 2 hours Laboratory)

545. Palaeoclimatology (4)

Prerequisites: ESP 200 or GEOG 340 and 200 (or equivalent) or consent of instructor.

Reconstructing and dating past climates, climate changes, and their environmental impacts, using such proxies as sediment sequences, packrat middens, ice cores, tree rings, corals, and documentary data. Earth's changing orbital parameters, internal forcing mechanisms, and human factors are analyzed.

Letter grade only (A-F). (Lecture 3 hours, lab activities 2 hours)

548./448. Environmental Assessment (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Introduction to the policy framework and techniques for assessing impacts on various aspects of the biological and physical environment. The course is a survey of multiple topics involving various types of environmental assessment, including data collection, processing and evaluation. (Undergraduates register in GEOG 448; graduates register in 548).

Letter grade only (A-F). (3 hours lecture, activity)

558./458. Hazards and Risk Management (3)

Prerequisite: ESP 200 or GEOG 340 or consent of instructor.

Broad overview of hazards and disasters, whether natural or technological, emphasizing the physical and social dynamics that interact to produce hazard, the spatial and temporal distributions of various hazards, and policy options for disaster preparation, loss reduction, and community resilience.

Letter grade only (A-F).

565./465. Social Geography (3)

Prerequisite: GEOG 360 or consent of instructor.

The geographies of society, including various methodological and theoretical approaches to social geography. Topics may include socio-spatial inequality, crime, housing, religious systems, medical and health geography, feminist geography, the geography of sexuality, the geography of race, or poststructuralist geography.

Letter grade only (A-F).

Geography Courses (GEOG)

567./467. Urban Geography: Metropolitan Problems (3)

Prerequisite: GEOG 360 or consent of instructor.

Geographic components of metropolitan problems and their solutions. Problems related to transportation systems, housing, evolution of ghettos, urban perception and behavioral patterns will be discussed in terms of theoretical and practically applied urban planning solutions.

(Lecture, problems 3 hrs) Letter grade only (A-F).

575. Geographical Applications in Remote Sensing (4)

Prerequisites: GEOG 140, 160, 473, and 474.

Focuses on remote sensing applications. Students will be introduced to sophisticated imagery and analysis techniques, as applied to weather and fire modeling, arid lands environmental problems, or the urban environment.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

584./484. Advanced Concepts in Presentation Cartography (4)

Prerequisite: GEOG 482 or consent of instructor.

Advanced theory and techniques for presentation cartography including communication, visualization, terrain representation, animation, and color.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

585./485. Principles of Geographic Information Science (4)

Prerequisites: GEOG 200 or equivalent and GEOG 280 or consent of instructor

Fundamental concepts and techniques of geographic information systems and science are introduced. Emphasizes spatial analyses to address spatial questions.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

586. Field Methods in Landscape Analysis (4)

Prerequisite: GEOG 340 or consent of instructor.

Introduction to field techniques, including formulation of field plans, recording direct observation, field mapping, sampling techniques, interviewing, and organizing and evaluating data for presentation.

(Seminar 1 hour; Field Work 6 hours). Letter grade only (A-F).

587A. Applications of Geographic Information Science (GIS): Environment and Natural Resources (4)

Prerequisites: GEOG 485 or 585 or consent of instructor.

The use of Geographic Information Systems and science for spatial query, problem analysis, spatial modeling and decision support in natural resource assessment. Students who possess a background in GIS are introduced to environmental applications. Emphasizes the use of raster GIS.

(3 hours Lecture, 2 hours of Laboratory)

587B. Applications of Geographic Information Science (GIS): Urban and Economic (4)

Prerequisite: GEOG 485 or 585 or consent of instructor.

Builds on introductory knowledge of Geographic Information Systems, spatial analysis and spatial data and focuses on urban and economic applications and analyses.

(3 hours Lecture, 2 hours Computer Laboratory)

588./488. Advanced Topics in Geographic Information Science (4)

Prerequisites: GEOG 485/585 and one of the following: 487A/587A, 487B/587B, 482, 484; or consent of instructor.

Advanced concepts in geographic information systems and

techniques are introduced and their applications in geography and related discipline explored.

(Seminar 3 hours; Laboratory 2 hours). Letter grade only (A-F).

596. Geographic Thought and Literature (3)

Prerequisite: Consent of instructor.

Proseminar in the history of 20th century Anglophone geographic thought with emphasis on the theoretical and interdisciplinary perspectives current in the field today.

Letter grade only (A-F).

640. Seminar in Physical Geography (3)

Prerequisite: Consent of instructor.

Physical/environmental issues and problems.

May be repeated to a maximum of 6 units with consent of departmental advisor. Letter grade only (A-F).

650. Seminar in Cultural Geography (3)

Prerequisite: Consent of instructor.

Systematic investigation of human occupancy in its varied environmental and regional settings.

May be repeated to a maximum of 6 units with consent of department advisor. Letter grade only (A-F).

666. Seminar in Urban Geography (3)

Prerequisite: Consent of instructor.

Geographic concepts and techniques of research applied to specific urban areas.

May be repeated to a maximum of 6 units with consent of department advisor. Letter grade only (A-F).

680. Seminar in Geospatial Science (3)

Prerequisite: Consent of instructor.

Application of geographic concepts and methodology to selected cartographic, GIS, remote sensing, and spatial analytic problems.

May be repeated to a maximum of 6 units with consent of departmental advisor. Letter grade only (A-F).

696. Seminar in Geographical Research Methods (3)

Prerequisites: GEOG 596, graduate standing in geography, and consent instructor.

Critical survey of contemporary methodologies available for framing research in geography, emphasizing the connection between research models, research questions, and the selection and limitations of particular methods, techniques, and data.

Letter grade only (A-F).

697. Directed Research (1-3)

Prerequisite: Consent of instructor.

Research in geography supervised on an individual basis.

Letter grade only (A-F).

698. Thesis (1-6)

Prerequisite: Consent of instructor.

Planning, preparation and completion of thesis for the master's degree.

Urban and Regional Studies Courses (U/ST)

UPPER DIVISION

General Education Category A must be completed prior to taking any upper division course.

3011. The Urban Scene (3)

Prerequisites: GE Foundation requirement, one or more Explorations courses, and upper-division standing.

Analysis of urban life-styles; land use and design; population trends; conflicts in the increasingly multicultural urban setting; housing and community development; suburban-central city relationships; human utilization of urban life spaces; opinions of landmark urbanists; and future trends.

Same course as GEOG 3011. Not open for credit to students with credit in GEOG 3011 or SOC 419.

Geographic Information Science Courses (GISC)

601. Introduction to Spatial Concepts (1)

Provides requisite theoretical and conceptual foundations in geographic information science.

Letter grade only (A-F). A grade of "C" or better is required for students to progress in the MS GISci program.

602. GIS Applications (3)

Prerequisites: GISC 601

Explores use of geographic information systems for spatial query, analysis, and modeling in natural and human environments. Focuses on analytic techniques and software tools for GIS-based management and problem solving.

Letter grade only (A-F). (2 hours lecture, 2 hours lab)

603. Cartographic Visualization (3)

Prerequisites: GISC 601 or consent of advisor

Provides advanced theory and techniques for presentation cartography including communication, visualization, terrain representation, animation, and color.

Letter grade only (A-F). (2 hours lecture, 2 hours lab)

604. GIS Data and Databases (3)

Prerequisites: GISC 601 or consent of advisor

Components of GIS data, geospatial databases and database design are reviewed. Topics include topology, data storage, data management and mechanisms for disseminating spatial data, including server technologies.

Letter grade only (A-F). 2 hours lecture, 2 hours lab)

605. GIS Programming (3)

Prerequisites: GISC 601

Provides training in the use of GIS-relevant programming languages. Students will learn fundamentals of object oriented programming, application development, basic coding, and will complete a project where they develop a GIS utility.

Letter grade only (A-F). (2 hours lecture, 2 hours lab)

606. Applied Remote Sensing (3)

Prerequisites: GISC 601 or consent of advisor

Principles and concepts of remote sensing and digital image processing are presented and applied. Students extract information from satellite and other data sources, focusing on enhancement and extraction techniques within the visible and near-infrared portions of the electromagnetic spectrum.

Letter grade only (A-F). (2 hours lecture, 2 hours lab)

607. Project Orientation and Support (1)

Prerequisites: GISC 601, 602, 603, 604, 605, 606 and 3 CCPE Science Plus courses, or consent of advisor

Introduces team-based research projects including a review of various research methods, responsible research conduct and project deliverables.

Letter grade only (A-F). (1 hour lecture) A grade of "C" or better is required for students to progress to GISC 608.

608. Applied Project (4)

Prerequisites: GISC 601, 602, 603, 604, 605, 606, a grade of "C" or better in 607, 3 CCPE Science Plus courses, or consent of advisor

Students demonstrate analytical, technical, business and interpersonal competencies acquired through the program in a team-based learning experience. Teams collaborate on an applied research project supervised by faculty and the project internship sponsor. A spatial problem is addressed and deliverable(s) produced.

Letter grade only (A-F).