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## GEOGRAPHY (GEOG)

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### **GEOG 121 Physical Geography (4 credits)**

This course is an introduction to physical geography phenomena (landforms, climate, oceans, soils) in which human-land relationships are central. The focus is on understanding the processes at work in the environment and on their interrelationships. Three hours of lecture and one two-hour laboratory period weekly. *Either semester. (Formerly GEOG 100) (CNSL)*

### **GEOG 122 The Physical World (3 credits)**

This course studies the formation and distribution of landforms, climates, soils and vegetation. Emphasis is placed on the interrelationships among these components of the environment and their significance to life on earth. *Either semester. Cannot be taken if GEOG 121 is taken for credit. (Formerly GEOG 120) (CNSN)*

### **GEOG 130 Environmental Geography (3 credits)**

The spatial aspects of the interaction between humans and their physical environment are examined through the analysis of selected problems from resource capacity to pollution. The perceptions of environmental hazards of human settlements are examined to illuminate environmental decision-making. *Either semester (Formerly GEOG 196) (CNSN)*

### **GEOG 151 Human Geography (3 credits)**

An inquiry into the theoretical and empirical approaches to the study of human spatial analysis is presented. The major topics covered include population, race, language, religion, politics, urbanization and economics. *Each semester (Formerly GEOG 110) (CGCL; CMCL; CSOC)*

### **GEOG 171 Geography of the Developing World (3 credits)**

This course in human geography introduces the geographical study of the current cultural and social systems in the non-Western world (in Africa, Asia and Latin America). Emphasis is placed on the diversity of cultural frameworks and their strategies for dealing with problems. *Fall semester (Formerly GEOG 160) (CGCL; CMCL; CSOC)*

### **GEOG 172 Regional Geography of the Global North (3 credits)**

The study of regional geography of the developed world (including Anglo-America, Europe and the Soviet Union, Australia and Japan) investigates how humans have used the resources available to them to obtain a high standard of living in different physical and cultural milieux. This high standard of living is reflected in land-use patterns that are similar in their broad outlines but different in detail. *Spring semester (Formerly GEOG 170)*

### **GEOG 199 First Year Seminar (3 credits)**

*Prerequisite: Open to all freshmen with a writing placement score of 3 or above or a SAT score of 500 or above. Students with 24 or more transfer credits will have this requirement waived.*

First Year Seminars (FYS) are writing-intensive, topic courses that introduce students to academic thought, discourse and practices. FYS courses prepare and orient students toward productive and fulfilling college careers by actively engaging them in a specific academic area of interest. Students will improve their writing, reading, research and basic information and technology skills while learning to work both collaboratively and independently. These courses will fulfill the First Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one FYS course may be taken for credit. (CFYS)

### **GEOG 213 Geographic Information Systems (GIS) I (3 credits)**

Maps are valuable tools for displaying, interpreting and analyzing patterns of human-environment interactions. This course introduces the basic concepts and procedures necessary to design, construct, interpret, update and present straightforward and effective maps using computer techniques. Students will practice skills of georeferencing and digitizing raster-based images at various scales to produce vector-based map layers for integration into geographic information systems (GIS). This course provides the necessary background for more advanced courses in GIS. *Fall semester*

### **GEOG 221 Meteorology (3 credits)**

*Prerequisite: GEOG 121 or GEOG 100 or GEOG 122 or GEOG 120 or EASC 100 or AVSC 105*

This course is designed to provide students with a basic understanding of how weather works, in a highly visual, hands-on and largely nonmathematical manner. Physical and chemical processes that occur in the atmosphere and interactions with the land and ocean surfaces on Earth lead to the weather (thunderstorms, tornadoes, hurricanes, etc.). Long-term persistent changes in weather patterns lead to climate change, which can disrupt travel plans, recreational activities, energy (fuel and electricity) resources, and ecosystem health, among other things. The main objective of this course is to introduce the meteorological concepts responsible for weather phenomena and the impact of disruptions of "normal" weather on life on Earth. The course will conclude with discussions of how human activities depend on and may be altering weather patterns, including the greenhouse effect, severe storms, hurricanes, aviation meteorology, air pollution, the ozone "hole" and winter weather. Two hours of lecture and one two-hour laboratory period weekly. *Fall semester*

### **GEOG 222 Climatology (3 credits)**

*Prerequisite: GEOG 121 or GEOG 122 or consent of instructor*  
Study of the elements and controls of climate emphasizing their effect on humans and the environment, and human's response to and modification of climate. The world distribution of climatic regions. Instrumentation and practice in observing, data presentation and analysis. *Spring semester (Formerly GEOG 204)*

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## **GEOG 290 Introduction to Geographic Analysis** **(3 credits)**

*Prerequisite:* For majors or minors in geography only; GEOG 121 or GEOG 151

This course provides a survey of spatial techniques that geographers use to define, research and analyze geographic issues and phenomena. Students will learn to identify real-life geographic problems at a range of spatial scales, from the local to the global. Instructional methods will emphasize hands-on exposure through local field problems and field trips, access to library resources and journals, instrumentation, basic surveying, and professional presentation skills. *Spring semester*

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## **GEOG 298 Second Year Seminar (Speaking Intensive)** **(3 credits)**

*Prerequisite:* \_\_\_\_199; Open to all sophomores and juniors who have completed ENGL 101, and the speaking skills requirement. Students with 54 or more transfer credits will have this requirement waived. Cannot be taken if \_\_\_\_299 is taken for credit.

Second Year Seminars (SYS) are speaking-intensive, topic courses that build on the academic skills and habits introduced in the First Year Seminar. SYS courses engage students in a specific academic area of interest and provide them with the opportunity to reinforce, share and interpret knowledge. Students will improve their speaking, reading, research and basic information and technology skills while building the connections between scholarship and action that are required for lifelong learning. These courses will fulfill the Second Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one SYS course may be taken for credit. (CSYS)

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## **GEOG 299 Second Year Seminar (Writing Intensive)** **(3 credits)**

*Prerequisite:* \_\_\_\_199; Open to all sophomores and juniors who have completed ENGL 101 and ENGL 102. Students with 54 or more transfer credits will have this requirement waived. Cannot be taken if \_\_\_\_298 is taken for credit.

Second Year Seminars (SYS) are writing-intensive, topic courses that build on the academic skills and habits introduced in the First Year Seminar. SYS courses engage students in a specific academic area of interest and provide them with the opportunity to reinforce, share and interpret knowledge. Students will improve their writing, reading, research and basic information and technology skills while building the connections between scholarship and action that are required for lifelong learning. These courses will fulfill the Second Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one SYS course may be taken for credit. (CSYS)

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## **GEOG 314 Satellite Image Processing Applications to the Environment (3 credits)**

*Prerequisite:* Any GEOG course; familiarity with computers recommended

The acquisition of information for intensive environmental monitoring is increasingly done through remote sensing, which permits a rapid, efficient manner for analysis and decision making by environmental researchers and resource managers. This course will explore techniques to analyze remotely sensed data using a variety of image-analysis systems. Principles of acquisition and interpretation of data collected by imaging sensor such as radar, thermal and multispectral scanners are discussed. Digital-image-processing techniques such as rectification and restoration (processing), image enhancement, image classification and data merging are covered. The course is taught as a combination of lectures and computer laboratory time with hands-on use of one of the remote-sensing softwares. *Offered alternate years, fall semester*

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## **GEOG 315 Quantitative Geography (3 credits)**

*Prerequisite:* MATH 110 and GEOG 290

Geographers use statistical techniques to measure, describe, classify, analyze, and display information (data) in search of spatial patterns and trends. Geographers make comparisons and examine relationships to answer questions, solve problems and make wise decisions that support a particular objective. This course introduces and applies statistical techniques and computer and model building methodology to analyze various spatial phenomena. (Formerly GEOG 474) (CQR)

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## **GEOG 317 Air Photo Interpretation — Remote Sensing** **(3 credits)**

*Prerequisite:* GEOG 100 or GEOG 122 or EASC 100

Theory and practice in extracting information about the earth's physical and cultural features from aerial photographs. Acquaints students with the detection, identification, and analysis of the earth's features through remote sensing. The application of computerized digital-image processing to satellite environmental data. Two hours of lecture and one two-hour laboratory weekly. *Fall semester*

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## **GEOG 321 Meteorology II (3 credits)**

*Prerequisite:* GEOG 221 or consent of instructor

Students will learn how to use meteorological measurements from local and global networks of weather stations to produce and analyze weather maps/charts using computer software. Laboratory exercises use meteorological software to visualize and interpret atmospheric patterns based on data from advanced computer models, satellite remote sensing, and networks of weather stations. In addition, students will augment computer modeling with laboratory techniques for simplifying, visualizing and analyzing complex atmospheric processes, such as the global circulation, turbulence and icing. The course includes field trips to professional meteorological agencies and observatories. *Alternate spring semesters*

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## **GEOG 322 Biogeography (4 credits)**

*Prerequisite:* GEOG 121 or BIOL 121

This field- and lab-based course presents the scope of biogeography as currently practiced in North America. In addition to the academic underpinnings of evolution, disturbance, ecology, and conservation, we explore the key topics of biomes, biodiversity,

*tMay be taken for graduate-level credit*

and animal and plant migration. Organisms vary greatly over space and over time, and thus are a prime topic of study for the geographer. *Alternate fall semesters*

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### **GEOG 323 Water Resources (3 credits)**

*Prerequisite: GEOG 290 or consent of instructor*

This course investigates the complex physical systems involved in the movement of water and how water interfaces with the human landscape. Students will outline and define the economic and legal relationships involved in the supply and demand of this required resource, and analyze problems associated with the management and planning of the distribution of this vital resource. *Alternate spring semesters*

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### **GEOG 324 Earth Surface Processes (4 credits)**

*Prerequisite: GEOG 290*

Process is the action produced when a force induces a change. The experiences in this course will introduce the student to the physical processes that create landforms on the earth's surface: mountains, river valleys, caves, dunes, coastlines, glaciers. Field work and laboratory techniques used in modern physical geography will help us analyze problems associated with current challenges in the earth's changing surface. *Alternate fall semesters*

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### **GEOG 331 Geography of Environmental Problems (3 credits)**

*Prerequisite: EASC 100 or GEOG 121 or GEOG 122*

Environmental problems are considered in this course from the geographer's point of view — problems such as population density and distribution; balanced land use and its philosophic, aesthetic, and scientific basis; the circulation of goods and people; and a comparison of levels of development. *Spring semester (Formerly GEOG 361)*

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### **GEOG 332 Management and Preservation of the Natural Environment (3 credits)**

*Prerequisite: Junior standing and consent of the instructor*

This course is devoted to a detailed examination of the occurrence, exploitation and conservation of natural resources, including minerals, soils, water, forest, grassland, fisheries, wildlife, recreation areas and scenery. Emphasis is placed on conservation in the United States. *Fall semester (Formerly GEOG 307)*

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### **GEOG 333 Geography of Environmental Justice (3 credits)**

*Prerequisite: Any GEOG course or consent of instructor*

This course describes problems of environmental justice as they affect disadvantaged populations. The course reviews the history of this social movement in the U.S. It then examines studies that link the environmental and civil rights movements in recent years and that describe the major problems of identifying environmental injustice both in categorical terms and as a spatial issue. Special attention is given to spatial measurement issues. *Alternate years, fall semester*

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### **GEOG 340 Geography Materials and Methods (3 credits)**

*Prerequisite: Any GEOG course*

This course is focused on the maps, globes, and other geographic learning material that are used in developing and extending geographic knowledge and insight. Current techniques and alternative frameworks in the field of geographic education are emphasized. The course details an examination of the strategies, texts, materials and media that can be used to enhance the teaching and learning of geography within our schools. It closely integrates geographic content and teaching methods so that a truly geographic view of the world can be developed in the classroom. *Offered alternate years, spring semester (Formerly GEOG 320)*

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### **GEOG 350 Economic Geography (3 credits)**

*Prerequisite: Any GEOG or ECON course or consent of instructor*

The geographical analysis of the distribution of economic activities such as production, exchange and consumption is presented in this course. Here we examine the principles underlying spatial variations in land use and economic development at the local, national and international levels. *Fall semester (Formerly GEOG 362)*

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### **GEOG 353 Urban Geography (3 credits)**

*Prerequisite: Any GEOG course or consent of instructor*

The geographic aspects of the city including location, function, land-use patterns and interaction. Fieldwork focuses on current problems facing urban life. *Fall semester*

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### **GEOG 354 Field Methods in Urban Geography (3 credits)**

*Prerequisite: GEOG 353*

A geography analysis of local urban areas and their problems, and the application of concepts learned in GEOG 353. Hours will be arranged.

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### **GEOG 355 Political Geography (3 credits)**

*Prerequisite: Any GEOG or POLI course*

The course examines the variation of politically organized areas and their relationships to each other. The focus is on the interaction of geographical factors (distance, location and distribution) and political process. Emphasis is on both state and non-state agents in the political arrangement of space. *Fall semester (Formerly GEOG 473)*

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### **GEOG 363 Locational Analysis (3 credits)**

*Prerequisite: GEOG 290 or consent of instructor*

The spatial approach is utilized to analyze retail, industrial, and public utility location. Topics covered include demographic analysis, retail structure, location factors and economic development. *Alternate years, fall semester*

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### **GEOG 365 Geography of Transportation (3 credits)**

*Prerequisite: Any GEOG course or consent of instructor*

This course will provide a spatial understanding of the role of transportation and interaction. It will provide an analysis of the

*tMay be taken for graduate-level credit*

importance of location relative to economic activities, development of distribution systems, flow analysis, effectiveness of distribution systems and the impact of transport systems on economic development. (Formerly GEOG 430)

### **GEOG 374 Geography of the Middle East (3 credits)**

This course provides a survey of the regional geography of the Middle East including the physical setting, environmental issues, economic development and the evolution of the Middle Eastern landscape and cultures. Special emphasis will be placed on current geopolitical issues in the region. *Alternate fall semesters* (CGCL; CMCL; CSOC)

### **GEOG 375 Geography of South Asia (3 credits)**

This course provides a survey of the physical and human geography of South Asia, particularly India, Pakistan, Bangladesh, Nepal, Bhutan, Maldives, and Sri Lanka. This course emphasizes the region's major environmental, economic and cultural geography patterns, processes and issues. Problems related to religious, ethnic and linguistic diversity are examined in the context of modernization and economic development. Interrelationships between South Asian nations will also be explored. (CGCL; CMCL; CSOC)

### **GEOG 376 Geography of East Asia (3 credits)**

This course offers a study of the physical and human geography of East Asia, in context of the interrelationships between East Asian countries, their neighbors, and the world. This course will investigate major political, economic, social and environmental geography patterns, processes, and issues of China, Taiwan, Japan, Korea, Vietnam and Malaysia.

### **GEOG 380 Geography of Russia/C.I.S. (3 credits)**

*Prerequisite: Any 100 level GEOG course*

The geography of environment, resources and population is studied in relation to history and the present economic and social system of the Russia/C.I.S. *Offered alternate years, fall semester*

### **GEOG 381 Geography of Latin America (3 credits)**

*Prerequisite: GEOG 121 or GEOG 122 or GEOG 151*

Physical and cultural patterns of selected countries of South America. Emphasis on current economic and political problems. (Formerly GEOG 358) (CGCL; CMCL; CSOC; CWRT)

### **GEOG 383 Geography of the United States (3 credits)**

*Prerequisite: GEOG 151*

The land and people of the United States intertwine to form a vast, complex, ever-changing fabric. As one of the great economic powers in the world, the U.S. must meet the challenges of governing a huge country of pronounced regionalisms, while living next door to the economic and political questions marks of Mexico and Canada. Students will explore such diverse topics as ancient mountain systems, environmental and resource issues, urban and rural immigrant populations and their historic and current distributions, regional cuisines and America's appeal to the traveler. *Alternate spring semesters*

### **GEOG 386 Geography of Canada (3 credits)**

*Prerequisite: GEOG 121 or GEOG 122 or consent of instructor*

The geography of environment, resources and population is examined in relation to history, economic and regional land patterns of Canada. *Offered alternate years, spring semester*

### **GEOG 388 Geography of Africa (3 credits)**

*Prerequisite: Any 100 level GEOG course*

The physical and cultural features of the African continent with special reference to the emerged political and regional patterns. *Spring semester* (CGCL; CSOC)

### **GEOG 400 Special Topics in Geography (3 credits)**

*Prerequisite: Junior standing or consent of instructor*

This course entails vigorous analysis of various topics of special interest. The course will be offered on an occasional basis and may be taken for credit more than once with change of topic.

### **GEOG 413 Geographic Information Systems (GIS) II (3 credits)**

*Prerequisite: GEOG 213 or consent of instructor*

This course offers a solid background in the fundamentals of Geographic Information Systems (GIS) to explore the analytical capabilities of GIS and apply them to real-world situations. Application of GIS techniques to problems in a variety of fields, including land-use planning, natural resource management, transportation, and urban and regional planning will be examined. Students develop their own projects and work at a more advanced level solving spatial problems with GIS. Students will have the practical experience of using GIS programming skills to solve real-world problems in a customized fashion.

*Spring semester*

### **GEOG 422 Online Weather Studies (3 credits)**

In this meteorology course, which is designed and serviced by the American Meteorological Society (AMS), students will access and work with current weather maps delivered via the Internet, and will coordinate these maps with learning activities keyed to the day's weather. This study of the atmosphere includes weather systems from local to global scales, severe weather and current weather applications. The course meets three times per semester for evaluation. All other activities are executed solely on the Internet, with the faculty mentor guiding the student in understanding the basic principles of meteorology and analyzing real-time weather data. *Spring semester* (Formerly GEOG 402)

### **GEOG 431 Environmental Regulations (3 credits)**

*Prerequisite: GEOG 130 or GEOG 331 or consent of instructor*

This course examines environmental regulation as a significant aspect of environmental geography, which is the study of spatial aspects of the interaction between humans and the natural world. In the United States, much of that interaction is mediated through environmental regulations, which in turn arise from a series of landmark environmental laws, including the Clean Air Act, the Clean Water Act, the Resources Conservation and Recovery Act and Superfund. Students will learn about the origins of these acts, how they give rise to regulations, and how

enforcement of regulations is articulated at the federal, state and local levels. Innovations such as toxic reduction will be discussed in a regulatory context, as will the implications of regulatory programs for non-government organizations, consultants and private industry. *Alternate spring semesters*

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### **GEOG 441 Geographic Frameworks (3 credits)**

*Prerequisite: GEOG 290 or consent of instructor*

This course enables undergraduate students majoring in primary or secondary education to develop a detailed understanding of the discipline of geography. State, national and international framework documents are examined, with particular attention to current Massachusetts frameworks. The course is organized around such fundamental geographic concepts as place, scale, regions and human-environment interaction. It demonstrates how geographers use these concepts to develop a greater understanding of the world. *Alternate fall semesters*

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### **GEOG 462 Principles of Urban Planning (3 credits†)**

*Prerequisite: GEOG 213 and GEOG 290; or consent of instructor*

An introduction to the process of planning which deals with the interrelationships of resources, facilities, activities, and people over time and space. *Offered alternate years, spring semester (Formerly GEOG 420)*

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### **GEOG 463 Applications in Urban Planning (3 credits)**

*Prerequisite: GEOG 462*

This course is intended for students with a strong interest in urban and regional planning. The course examines past cases and future proposals for a variety of land use and zoning decisions. The focus is on applying good growth management practices that allow communities to sustain their economic health, foster diversity, and promote sense of place. Students will analyze current trends in population, employment and housing in order to construct an example master plan that relates these factors to land use and development choices that promote smart growth. *Alternate years, spring semester*

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### **GEOG 490 Seminar in Geography (3 credits†)**

*Prerequisite: Open to geography majors in their final year*

The historical development of methods and techniques used in geographic research. Preparation of a research paper on a problem selected from one of the subdivisions of geography. For senior geography majors. *Fall semester (CWRM)*

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### **GEOG 497 Undergraduate Research in Geography (3 credits)**

*Prerequisite: Junior or senior standing and acceptance by the supervising faculty member*

Students who are accepted by a faculty member as a participant in an undergraduate field or laboratory research project enroll in this course. Projects entail research in the faculty member's subdiscipline and are publicized as they become available. Students are extensively involved in experimental planning, execution, analysis and reporting, and present their results to the department.

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### **GEOG 498 Internship in Geography or Planning (3-6 credits)**

*Prerequisite: Consent of the department; formal application required*  
Student internships in local planning department or agency. The purpose of this internship is to provide a student with experience in various aspects of his/her planning interest. *Either semester*

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### **GEOG 499 Directed Study in Geography (1-3 credits)**

*Prerequisite: Consent of the department; formal application required*  
Directed study is open to juniors and seniors who have demonstrated critical and analytical abilities in their studies and who wish to pursue a project independently. May be taken twice for a maximum of six credits. *Either semester*

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### **GEOG 504 On-Line Weather Studies (3 credits)**

This is a meteorology course that will cover all major aspects of atmospheric processes, including weather systems from local to global in scale and severe weather. This on-line course will involve work with current weather maps and data delivered via the Internet, and will coordinate this information to the day's weather. The instructor guides the student in understanding the basic principles of meteorology and in analyzing real-time weather data. The class meets in a formal classroom three times per semester. A research project is required which is keyed to the background and interests of each student. *Spring semester*

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### **GEOG 520 Special Topics in Geography (1-3 credits)**

*Prerequisite: May be specified depending on the nature of the topic*  
Special topics of current relevance to geography will be offered from time to time. The topic to be offered will be announced prior to registration. This course may be taken more than once for different topics.

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### **GEOG 551 Geography in the Middle School (3 credits)**

This course examines in depth the characteristic features of countries on six continents as delineated by the Massachusetts curriculum framework. Course participants will develop the geographic content that can be translatable for classroom use at the middle school level. The purpose of the course is for teachers to develop the necessary knowledge, insights, and teaching approaches so that they can teach, with confidence, about the various regions of the world. The geographic approach used in the course integrates historical, economic, and political issues in order to develop a more comprehensive understanding of our world.

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### **GEOG 580 The Regional Method in Geographic Analysis (3 credits)**

This course examines the nature of regionalism as a heuristic device. The purposes and problems of regionalization are explored in a variety of contexts where human and physical phenomena interact. Regions are analyzed and changing social constructs essential for the spatial analysis so central to geographic inquiry. The course examines changing definitions of regionalism from the French *compage* to the fluid functional regions of contemporary life.



# Course Descriptions

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## Other Approved Courses

GEOG 382 Geography of Europe

GEOG 500 Planning and Urban Environment

GEOG 502 Research

GEOG 503 Directed Study

GEOG 521 Improving the Teaching of Earth Sciences, Geography  
and Energy II

GEOG 550 Contemporary Issues in Geography

GEOG 555 Field Methods in Geographic Inquiry

GEOG 560 Seminar in Geographic Education

GEOG 565 Geotechnology

GEOG 570 Planning and Economic Development

GEOG 575 Environmental Issues: Problems and Solutions