

# GEOGRAPHY (GEG)

## GEG 101 WORLD NATURAL ENVIRONMENTS

3, 3/0; NS23

Nature of geography; earth-sun relationships; maps and map interpretation; and classification, distribution, and origins of the major elements of the natural environment: weather, climates, soils, natural vegetation, landforms, and developmental processes. Offered every semester.

## GEG 102 HUMAN GEOGRAPHY

3, 3/0; SS23

Introduction to cultural geography through the application of five themes: religion, diffusion, ecology, interaction, and landscape. The distribution of value systems, ethnicity, language, religion, and population as indices of human variety. Cultural impacts of globalization. Offered every semester.

## GEG 103 INTRODUCTION TO ENVIRONMENTAL SUSTAINABILITY

3, 3/0; NS23

Introduction to the study of sustainability and human-environment interactions. Applies the principles of sustainability to current environmental and social problems such as climate change, biodiversity loss, energy and resource use, waste management, food security, and environmental justice. Offered at least once per year.

## GEG 120 CAVERN STUDIES

1, 1/0

The development and unique environment of solution caves. Students will explore caves while on a weekend field trip, studying cave development and the formation of depositional features. Other topics include cave climatology, biology, chemistry, and the application of survey/mapping techniques. Offered occasionally.

## GEG 206 GEOGRAPHY OF NEW YORK STATE

3, 3/0

Landforms, regions, climates, and natural resources; distribution of population; location and functions of cities; development of transportation; utilization and conservation of soil, mineral, forest, wildlife, and water resources; industrial development. Offered occasionally.

## GEG 241 METEOROLOGY

3, 3/0; NS23

An introduction to weather, including the makeup of the atmosphere, seasonality, heat and radiation balance, temperature, humidity, and precipitation, atmospheric motion, atmospheric pressure and wind, air masses and fronts, severe weather, meteorological instrumentation, local weather, climate controls, and synoptic forecasting. Includes laboratory modules. Emphasis on the relationship between weather systems, technology, and humans. Offered at least once a year. Equivalent Course: GES 241

## GEG 295 RESEARCH EXPERIENCE IN GEOGRAPHY

1-3, 0/0

Prerequisite: Instructor Permission. Scholarship or creative work conducted under the supervision of a faculty member. Offered occasionally.

## GEG 300 WORLD REGIONAL GEOGRAPHY

3, 3/0

National and state geography standards; concept of region; map essentials; physical, cultural, economic, and political geography fundamentals within selected regions. Offered occasionally.

## GEG 305 PRINCIPLES OF ECONOMIC GEOGRAPHY

3, 3/0

Prerequisite: One Social Science course. Introduction to the theoretical study of economic geography; location theory; theoretical spatial distribution of economic activities, including agriculture, manufacturing, urban land use, services, and transportation. Offered occasionally.

## GEG 307 CONSERVATION AND ENVIRONMENTAL MANAGEMENT

3, 3/0

Prerequisites: One natural science course. Globalization, recent technological advancement, and effects on resource conservation and environmental management in the face of increased pressure from society. Current resources, globalization of environmental issues and pollution, new technologies and economic impacts. Offered occasionally.

## GEG 309 URBAN GEOGRAPHY

3, 3/0; DI23

Prerequisite: One social science course. Internal spatial structure of American metropolitan areas and their relationships. Spatial arrangements of land uses; ethnics, racial and economic composition of the population; dynamics of population growth and change; influence of minorities on cities and suburbs; geographic consequences of poverty and segregation on growth and change; transportation and fiscal problems confronting local governments. Offered every semester.

Equivalent Course: PLN 309

## GEG 310 URBAN TRANSPORTATION PLANNING

3, 3/0

Prerequisite: Junior or Senior level. Comparative study of the modes of transportation, transportation planning, and the benefits and effects of transportation. Emphasis on application to urban transportation. The importance of accessibility to the development of a modern metropolitan transportation system. Offered occasionally.

### GEG 325 MAPS AND MAPMAKING USING GIS

3, 3/0

Maps as essential form of communication. Geographic information systems (GIS) tools for creating digital and hardcopy maps. Spatial thinking, concepts, principals and methods of mapmaking; map development and display using technology. Offered every semester.

Equivalent Course: PLN 325

### GEG 359 ARCTIC GEOGRAPHY FROM AN INUIT PERSPECTIVE

3, 3/0; GA23

Prerequisite: One Social Science course. A study of the physical, political, economic and cultural environments of Arctic regions from an Inuit perspective. Topics focus on interaction between the Arctic environment and its peoples before and after Euro-American contact. Students will also study contemporary issues in today's Arctic. Offered occasionally.

### GEG 360 GEOGRAPHY OF ASIA

3, 3/0; GA23

Prerequisite: One social science course. A regional geographic analysis of south, east, and southeast Asia. Overview of the continent's natural environment. Examination of the principal elements of the cultural environment: demography and ethnicity, urbanization, economy, and political structure. Interaction between the physical and cultural environments. Offered annually.

### GEG 362 GEOGRAPHY OF THE UNITED STATES AND CANADA

3, 3/0; AH23

Prerequisite: One Social Science course. Basic geographic elements of North America including the natural environment, natural resources, economic activities, population, and urbanization. Offered occasionally.

### GEG 365 SOIL SCIENCE AND MANAGEMENT

3, 3/0

Prerequisite: GEG 101 or GES 101 or BIO 213 Introduction to the study of soils, including physical and chemical properties, weathering and soil formation, productivity and management for agriculture, soil erosion and conservation, engineering properties, soil classification. Includes regular laboratory assignments and fieldwork to enhance understanding of soil properties. Offered occasionally.

### GEG 382 WEATHER FORECASTING

3, 3/0

Prerequisites: Upper-division status and GEG 101 or GEG 240 or GES 241. A focus on synoptic and dynamic meteorology, as applied to weather forecasting. Weather conditions will be diagnosed using various case studies. Learn how to develop and to present weather forecasts. Emphasis on practice and interpretation of daily weather and modeled data. Offered occasionally.

### GEG 383 EXTREME WEATHER

3, 3/0

Prerequisite: Upper-division status. In-depth look at meteorological phenomena related to severe and unusual weather-related events and patterns, weather-analysis tools, climate-change outlooks, and social implications; planning and management strategies to prepare and respond to severe and unusual weather. Offered occasionally.

### GEG 384 ATMOSPHERIC SCIENCE

3, 3/0

Prerequisite: Upper-division status. Study of the earth's atmosphere as a unique place. Emphasis on atmospheric structure and composition, dynamics of motion, moisture and clouds, atmospheric chemistry, regional and local air pollution, aurora displays, and optical phenomena. Includes a study of atmospheres ranging from those of other planets to indoor air. Offered occasionally.

### GEG 385 PAST CLIMATES AND ENVIRONMENTS

3, 3/0

Prerequisite: GEG 101 or GES 101. Methods and theories used in reconstructing and dating past climates. Focus on the past 2 million years, including proxies such as ice cores, sediment sequences, packrat middens, tree rings, corals, and historical data. Causes of climate change and human interactions emphasized. Offered occasionally.

### GEG 386 WEATHER AND SOCIETY

3, 3/0

Prerequisites: Upper-division status. Use of climatic information in various aspects of our lives to solve practical problems with environmental, social, and economic implications. The importance of climate on agriculture, human health, severe weather management, litigation, commerce, architecture, and city planning. Offered occasionally.

### GEG 389 TOPIC COURSE

3, 0/0

Current topics in Geography and Environmental Geography. Offered occasionally.

### GEG 390 QUANTITATIVE METHODS IN GEOSCIENCES

3, 3/0

Prerequisites: Upper-division status. Introduction to statistical methods with a focus on spatial and time-series data analysis in Geo science applications. Statistical theory is reinforced through application of commonly used computer software to solve real world problems. Offered occasionally.

### GEG 396 RESEARCH METHODS

3, 3/0; IN23, RE23

Prerequisites: GEG 390 or PLN390 or MAT 311, and 6 upper division credits in GEG/PLN courses. Research theories, designs, and methods relevant to conducting research in geography and planning. Research designs and methodologies for approaches with human subjects, human/social geography, physical geography, field-based research, and planning projects. Development of a research project proposal. Offered fall only.

### GEG 405 URBAN ANALYSIS USING GIS

3, 3/0

Prerequisites: GEG 309 and GEG 325; or instructor permission. Data and techniques for analyzing urban systems and urban areas using Geographic Information Systems (GIS). Implementation of urban models introduced in GEG 309. Offered occasionally.

Equivalent Course: PLN 405

### GEG 415 PROSEMINAR

3, 3/0

Investigation, examination, and discussion of topics of current interest in geography. Techniques and analysis of geographic research. Offered occasionally.

### GEG 416 GEOGRAPHIES OF DEVELOPMENT

3, 3/0

Prerequisites: Upper division status. Development theories, progress, issues, and challenges in developing regions around the globe. In-depth analyses of factors influencing development policies and outcomes; impact of globalization on development efforts and practices in developing areas around the world. Offered occasionally.

### GEG 418 REMOTE SENSING

3, 3/0

Prerequisites: Upper division status or Instructor Permission. Concepts of remote sensing and its applications. Principles and methods of electromagnetic radiation, aerial and space remote sensing. Basics of digital image processing, spatial data capture and interpretations from remote sensors. Offered fall only.

### GEG 421 WATERSHED ANALYSIS

3, 3/0

Prerequisites: GEG 101 or GES 101 or BIO 213 or Instructor permission. Introduction to the systematic analysis of stream dynamics of watersheds and the impact of humans on these dynamics. Emphasizes the importance of physical, chemical, and biological processes in watershed management. Class discussion and a class project will focus on a practical watershed assessment problem. Offered occasionally.

### GEG 423 BIOGEOGRAPHY

3, 3/0

Prerequisite: Upper-division standing. Global patterns of species distributions and the historic, environmental, and biological processes underlying these patterns. Spatial patterns of nature's geographic variation at multiple levels, from individuals to ecosystems to biomes. Impacts of humans and climate change on biogeography. Offered occasionally.

### GEG 425 FUNDAMENTALS OF GIS

3, 3/0

Prerequisites: GEG/PLN 325 or equivalent, or instructor permission. Principles and methods of spatial data capture, automation, spatial database models and structures. Fundamentals of spatial data processing and analytical methods including spatial database query, database join and spatial join, geographic location and geographic coordinate systems, spatial geocoding, buffering, map overlay, and raster surface interpolations. Offered spring only.

### GEG 428 ENVIRONMENTAL ASSESSMENT AND PLANNING APPLICATIONS IN GIS

3, 3/0

Prerequisite: GEG 425 or equivalent. Advanced concepts of GIS with a focus on spatial analytical applications in GIS for environmental assessment and planning. GIS theories and software implementations are presented through lecture and hands-on practice to solve real world environmental and planning problems. Offered fall only.

### GEG 429 ADVANCED TOPICS IN GIS

3, 3/0

Prerequisite: GEG 425 or equivalent GIS course. Builds from the topics covered in GEG 425 Fundamentals of GIS, focusing on digital representation of the human and physical environment, including location referencing from a human perspective, database design, data quality issues (how to identify and document errors), spatial statistical analysis using GIS, the fourth dimension (time) in GIS, and understanding spatial analysis algorithms and models. Offered occasionally.

### GEG 430 SENIOR THESIS

3, 3/0

Prerequisites: GEG/PLN 390 and GEG/PLN 396 C or better and senior geography or planning major. Research in geography and presentation of selected research-related topics. Offered by contract only.

### GEG 478 GLOBAL CHANGE

3, 3/0

Prerequisite: GEG 101 or instructor permission. Interdisciplinary study of the principles needed to understand human impacts on the natural environment. Climate variability and global warming; nutrient cycling; land-use issues; connections and feedbacks among climate, ecosystems, and biogeochemistry; impacts of global change on society; policy measures; potential solutions. Offered occasionally.

### GEG 485 INTERACTIVE AND WEB-BASED MAPPING

3, 3/0

Prerequisite: GEG325. Introduction to interactive and web based mapping. Explore different approaches to communicating with maps on the Internet. Learn how to create web-based mapping applications. Offered occasionally.

### GEG 488 INTERNSHIP

1-12, 0/0

Prerequisites: GEG 101 and 6 credit hours of geography or planning coursework at the upper-division level; minimum cumulative and major GPA of 2.5; background of courses or experience within area of interest; adviser and department chair permission. Guided, supervised field experiences that complement the academic program. Offered every semester.

### GEG 495 SPECIAL PROJECT

1-3, 0/0

Offered occasionally.

### GEG 497 WORKSHOP

1, 0/0

Geography workshop. Offered occasionally.

### GEG 499 INDEPENDENT STUDY

3-12, 0/0

Offered occasionally.

### GEG 503 CONSERVATION AND ENVIRONMENTAL MANAGEMENT

3, 3/0

Principles of natural resource conservation; selected problems in resource conservation: soil erosion; water pollution; destruction of forests, grasslands, and wildlife; flood control; depletion of minerals. Emphasizes conservation in the United States and New York State.

### GEG 508 STUDIES IN THE GEOGRAPHY OF NEW YORK STATE

3, 3/0

Offered by contract only. Physical landscape; cultural geography and settlement; primary economic activities; urban systems and environments; planning and future development of the state.

### GEG 518 REMOTE SENSING

3, 3/0

Prerequisites: CIS 151 or equivalent, or instructor permission. Concepts of remote sensing and its applications. Principles and methods of electromagnetic radiation, aerial and space remote sensing. Basics of digital image processing, spatial or geographic data capture and interpretations from remote sensors.

### GEG 521 WATERSHED ANALYSIS

3, 3/0

Prerequisite: Instructor permission. Introduction to the systematic analysis of stream dynamics of watersheds and the impact of humans on these dynamics. Physical, chemical, and biological processes in watershed management. Class discussion and class project focus on a practical watershed assessment problem.

### GEG 523 BIOGEOGRAPHY

3, 3/0

Prerequisite: Graduate-level standing. Global patterns of species distributions and the historic, environmental, and biological processes underlying these patterns. Spatial patterns of nature's geographic variation at multiple levels, from individuals to ecosystems to biomes. Impacts of humans and climate change on biogeography.

### GEG 525 FUNDAMENTALS OF GIS

3, 3/0

Prerequisites: Instructor permission. Principles and methods of spatial data capture, automation, spatial database models and structures. Fundamentals of spatial data processing and analytical methods including spatial database query, database join and spatial join, geographic location and geographic coordinate systems, spatial geocoding, buffering, map overlay, and raster surface interpolations. Offered every semester.

### GEG 528 ENVIRONMENTAL ASSESSMENT AND PLANNING APPLICATIONS IN GIS

3, 3/0

Prerequisite: Instructor permission. Advanced concepts of GIS with a focus on spatial analytical applications for environmental assessment and planning. GIS theories and software implementation through hands-on practice to solve real-world environmental and planning problems.

### GEG 529 ADVANCED TOPICS IN GIS

3, 3/0

Prerequisites: GEG 425/525 or equivalent GIS course; or instructor permission. Builds from the topics covered in GEG 525 Fundamentals of GIS focusing on digital representation of the human and physical environment, including location referencing, database design, data quality issues, spatial statistical analysis using GIS, and understanding spatial analysis algorithms and models. Introduces programming in a GIS environment. Offered spring semesters only.

### GEG 565 SOIL SCIENCE AND MANAGEMENT

3, 3/0

Prerequisite: Instructor permission. Introduction to soil properties and their influence on physical, chemical, and biological processes. The role of soils in the transportation and fate of water and chemicals. The importance of soils for watershed management and protection of aquatic ecosystems.

### GEG 584 GEOSPATIAL PROGRAMMING

3, 3/0

Prerequisites: Instructor permission; it is recommended that students have basic knowledge about spatial databases. Introduction to Python programming focusing on the development of Python scripts and custom tools for processing and analysis of geospatial data. Automating geoprocessing workflows, creating custom analysis tool, and customizing user interfaces.

### GEG 585 INTERACTIVE AND WEB-BASED MAPPING

3, 3/0

Prerequisite: GEG 325 or equivalent introductory GIS course. Introduction to interactive and Web-based mapping. Different approaches to communicating with maps on the Internet; how to create Web-based mapping applications.

### GEG 587 TOPICS IN GEOGRAPHY

1-4, 1/0

In-depth examination of rapidly and significantly changing disciplinary issues, topics, or practices; offered occasionally.

### GEG 588 TOPICS COURSE

3, 3/0

### GEG 590 INDEPENDENT STUDY

1-3, 0/0

### GEG 610 SEMINAR

3, 3/0

Prerequisite: 12 hours of geography coursework or instructor permission. Investigation, examination, and discussion of topics of current interest to geographers. Topics to be announced. May be taken more than once.

### GEG 619 WETLAND HYDROLOGY AND ECOLOGY

3, 3/0

Instructor Permission; BIO 315 or equivalent; GEG 421/521 or equivalent. Introduction to physical, chemical, and ecological processes in wetlands. Impact of wetlands on watershed hydrology and nutrient cycling. Management approaches for wetlands and key regulations that protect wetlands.

### GEG 690 MASTER'S PROJECT

3, 0/0

Research or investigation of a particular problem, planned and carried out by the student with consultation and guidance from the instructor, submitted in acceptable form according to the directions given by the Department of Geography and Planning.

### GEG 721 THESIS/PROJECT CONTINUATION

0, 0/0

### GEG 722 THESIS/PROJECT EXTENDED

0, 0/0