GEG 101 WORLD NATURAL ENVIRONMENTS
3, 3/0; NS14
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; SS14
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 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 fall only.

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 annually each fall semester.

GEG 241 METEOROLOGY
3, 3/0; NS14
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 every semester. 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 spring only.

GEG 303 GLOBAL CLIMATOLOGY
3, 3/0
Prerequisite: GEG 101. Study of the earth's climate through analysis of climatic controls, classification schemes, and feedback cycles. Includes an examination of past climates and global climate change scenarios. Offered alternate years. Equivalent Course: GEG 303W

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 alternate years.

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 every semester. Equivalent Course: GEG 307W

GEG 309 URBAN GEOGRAPHY
3, 3/0; DI14
Prerequisite: One social science course. Internal spatial structure of American metropolitan areas and their relationships. Spatial arrangements of land uses; ethnicity, 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: GEG 309W
GEG 310 URBAN TRANSPORTATION PLANNING
3, 3/0
Prerequisite: GEG 309 or PLN 215. 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 alternate years.
Equivalent Course: PLN 310

GEG 316 WATERSHED POLLUTION
3, 3/0
Pre-requisites: GEG 101 or GES 101. Important pollutants and toxic chemicals generated by anthropogenic activities and their transport, transformation, and fate within watersheds. Impacts of these pollutants on soil, forest, and aquatic ecosystems using specific case studies. 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 330 LAND RESOURCE ANALYSIS AND PLANNING
3, 3/0
Prerequisite: PLN 315. The principles of land resource management with emphasis on land-use patterns, controls, and policies. Attention to urban, suburban, and rural land-use situations. Offered alternate years.

GEG 345 BAHAMAS FIELD EXPERIENCE
3, 1/4
Prerequisites: Sophomore or higher standing. A 10-day field study of San Salvador, Bahamas. Coral reefs, sand flats, karst landscapes, vegetation, dunes, caves, indigenous peoples, Columbus’ landfall, historic sites, island culture. Emphasis on lab and field activities. Offered spring only.

GEG 359 ARCTIC GEOGRAPHY FROM AN INUIT PERSPECTIVE
3, 3/0; NW14
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 fall only.

GEG 360 GEOGRAPHY OF ASIA
3, 3/0; NW14
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 every semester.

GEG 362 GEOGRAPHY OF THE UNITED STATES AND CANADA
3, 3/0; WC14
Prerequisite: One Social Science course. Basic geographic elements of North America including the natural environment, natural resources, economic activities, population, and urbanization. Offered alternate years.

GEG 364 GEOGRAPHY OF EUROPE
3, 3/0; WC14
Prerequisite: One social science course. Physiographic regions, landforms, climate, vegetation, soils, and drainage patterns. Culture regions, language, religion, population, migration, politics, economics, and impacts on the natural environment. Interdependence of regions within Europe and within the global context. Excludes the former Soviet Union. Offered every semester.

GEG 365 SOIL SCIENCE AND MANAGEMENT
3, 3/0
Prerequisite: GEG 101 or GES 101. 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 375 PRINCIPLES OF HYDROLOGY
3, 3/0
Prerequisite: GEG 101 or GES 101. Principles of hydrology and its relationship to water resource management. Emphasis on describing the processes governing surface and groundwater movement. Field trip provides example of the practical application of hydrologic principles. Offered alternate years.

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 alternate years.

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 alternate years.

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 alternate years.
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 alternate years.

GEG 386 WEATHER AND SOCIETY
3, 3/0
Prerequisite: 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 alternate years.

GEG 389 TOPIC COURSE
3, 0/0
See the Undergraduate Course Catalog (http://catalog.buffalostate.edu/undergraduate/docs/currentugcat.pdf).

GEG 390 QUANTITATIVE METHODS IN GEOGRAPHY AND PLANNING
3, 3/0; CT14, IM14, WIIF
Prerequisites: Upper-division status. Introduction to statistical methods with a focus on spatial and time-series data analysis in Geography and Planning applications. Statistical theory is reinforced through application of commonly used computer software to solve real world problems. Offered spring only.
Equivalent Course: PLN 390

GEG 396 RESEARCH METHODS
3, 3/0; IM14, WIIF
Prerequisites: GEG 390 or PLN390, 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.
Equivalent Courses: GEG 396W, PLN 396, PLN 396W

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 alternate years.
Equivalent Course: PLN 405

GEG 409 INDUSTRIAL GEOGRAPHY
3, 3/0
Prerequisites: Upper-division status. The manufacturing sector, firms, and industrial location process and activities that have taken place in the United States; production methods and processes; industrial districts and the principal factors that affect the locations of firms; local and regional development; globalization. Offered alternate years.
Equivalent Course: GEG 409W

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 alternate years.

GEG 418 REMOTE SENSING
3, 3/0
Prerequisites: GEG or PLN 325. 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 alternate years.

GEG 419 GLOBALIZATION, TECHNOLOGY, COMPETITION, AND SERVICE ECONOMIES
3, 3/0
Prerequisite: Upper division status. Examination of globalization, technological advancement in recent years, and their effects on the service industry and competitiveness of firms and nations. In-depth studies of the U.S. service sector, competitive strategies, globalization, and new technologies are provided. Offered alternate years.

GEG 421 WATERSHED ANALYSIS
3, 3/0
Prerequisites: Upper-division status; GEG 101 or GES 101. 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 alternate years.

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 alternate years.

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 every semester.

GEG 427 CORPORATE APPLICATIONS IN GIS
3, 3/0
Prerequisites: GEG or PLN 325. This course is composed of a series of lectures, class assignments and projects that are designed to teach students the fundamentals and application of Geographic Information Systems (GIS) and geographic analysis within a business environment. Students will learn how to conduct specialized business GIS related projects. These projects range from data integration to market assessment and site assessment.
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 alternate years.

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 spring semesters only.

GEG 430 SENIOR THESIS  
3, 3/0; CT14, WIIF  
Prerequisites: GEG/PLN 390 and GEG/PLN 396 C or better and senior geography or planning major. Research in geography or planning and presentation of selected research-related topics. Offered spring only.  
Equivalent Courses: GEG 430W, PLN 430, PLN 430W

GEG 478 GLOBAL CHANGE  
3, 3/0  
Prerequisite: GEG 101. 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 alternate years.

GEG 480 AIR POLLUTION APPLICATIONS  
3, 3/0  
Prerequisites: Upper-division status; GEG 101, GEG 199 or an equivalent course, GEG 384, and GEG 390 or an equivalent course. Receptor, dispersion, and risk assessment modeling techniques to determine the source, fate, and impact of air pollutants. Overview of atmospheric deposition, regional transport, and global circulation models. Offered occasionally.

GEG 485 INTERACTIVE AND WEB-BASED MAPPING  
3, 3/0  
Prerequisites: GEG 425 or instructor permission. 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 alternating years, spring semester.

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 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  
See the Undergraduate Course Catalog (http://catalog.buffalostate.edu/undergraduate/docs/currentugcat.pdf).

GEG 499 INDEPENDENT STUDY  
3-12, 0/0  
Offered occasionally.