GEOGRAPHY

The Department of Geography is dedicated to achieving excellence in research and education through the diffusion of geographic knowledge that focuses on the relationships between the physical world and its occupation and modification by humans. Students trained in geography understand society and environmental dynamics, the significance of scale, the uneven distribution of resources and levels of development, and the uses of geospatial techniques, including geographic information systems (GIS) and remote sensing.

UNDERGRADUATE

Bachelor's programs

- Bachelor of Arts with a major in geography (https://bulletin.gwu.edu/arts-sciences/geography/ba/)
- Bachelor of Arts with a major in environmental studies (https://bulletin.gwu.edu/arts-sciences/environmental-studies/ba/)
- Bachelor of Science with a major in environmental and sustainability science (https://bulletin.gwu.edu/arts-sciences/geography/environmental-and-sustainability-science/)

Minors

- Minor in geographic information systems (https://bulletin.gwu.edu/arts-sciences/geography/minor-geographic-information-systems/)
- Minor in geography (https://bulletin.gwu.edu/arts-sciences/geography/minor/)

GRADUATE

Master's program

- Master of Science in the field of geography (https://bulletin.gwu.edu/arts-sciences/geography/ms/)

Combined program

- Dual Master of Science in the field of geography and Graduate Certificate in geographical information systems (https://bulletin.gwu.edu/arts-sciences/geography/ms/certificate-geographical-information-systems/)

CERTIFICATE

Graduate certificate program

- Geographical information systems (https://bulletin.gwu.edu/arts-sciences/geography/certificate-geographical-information-systems/)

FACULTY

Faculty

Professors: L. Benton-Short, E. Chacko, M.D. Price, N. Shiklomanov

Associate Professors: M. Atia, R. Engstrom, M. Keeley, M. Mann, D. Rain (*Chair*), D. Streletskiy

Assistant Professors: G. Allington, D. Cullen, B. Hurley, A. Luthra, M. Kansanga

Professorial Lecturers: R. Hinton, S. Johnson, W. Reisser, S. Sklar, D. Squire

COURSES

Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-level undergraduate courses that also may be taken for graduate credit with permission and additional work assigned
- Those in the 6000s and 8000s are for master's, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

GEOG 1000. Dean's Seminar. 3 Credits.

GEOG 1001. Introduction to Human Geography. 3 Credits.
A systematic survey of human geography; spatial perspectives on demographic, social, cultural, economic, and political changes around the world.

GEOG 1002. Introduction to Physical Geography. 4 Credits.
A systematic survey of environmental geography; perspectives on environments and human ecology, including ecosystems and their use, and resource geography. Laboratory fee.

GEOG 1003. Society and Environment. 3 Credits.
An introduction to the dynamic relationship between society and the physical environment, with focus on population, natural resources, environmental degradation, pollution, and conservation.

GEOG 1099. Variable Topics. 1-36 Credits.

GEOG 2000. Sophomore Colloquium. 3 Credits.
Sophomore colloquia are small, seminar-type classes that deeply engage CCAS second-year students in a discipline, focus on a narrow issue of high interest and impact, and require independent research projects. May be repeated provided topic differs. Consult the Schedule of Classes for more details. Restricted to CCAS sophomores.

GEOG 2104. Introduction to Cartography and GIS. 3 Credits.
Fundamentals of cartography. Geographic data structure and information systems.

GEOG 2120. World Regional Geography. 3 Credits.
Practical approach to the themes, concepts, and tools appropriate for in-depth examination of the geography of the world's. Historical and physical regional geographies; contemporary regional issues; and intra- and interregional issues.

GEOG 2124. Urban Transportation. 3 Credits.
The relationship between freight and passenger transportation systems and urban land use patterns and structure. Prerequisite: GEOG 1001.

GEOG 2125. Transportation Systems and Networks. 3 Credits.
The structure and evolution of transportation networks and their impact on regional development.

GEOG 2127. Population Geography. 3 Credits.
Patterns of world population; factors contributing to population pressures, growth, and migrations.

GEOG 2129. Biogeography. 3 Credits.
The spatial and temporal patterns of biological diversity and the processes that cause those patterns. Combines ecology, evolutionary biology, paleontology, and climatology. Credit cannot be earned for this course and GEOG 2129W.

GEOG 2129W. Biogeography. 3 Credits.
The spatial and temporal patterns of biological diversity and the processes that cause those patterns. Combines ecology, evolutionary biology, paleontology, and climatology. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

GEOG 2133. People, Land, and Food. 3 Credits.
The relationship between humans and their food sources through exploration of nutritional dynamics, food sourcing, agricultural land use, and food markets.

GEOG 2134. Energy Resources. 3 Credits.
Analysis of regional patterns and trends in consumption and production of energy resources. Examination of international energy linkages and energy policies of selected nations. Prerequisite: GEOG 1002.

GEOG 2134W. Energy Resources. 3 Credits.
Analysis of regional patterns and trends in consumption and production of energy resources. Examination of international energy linkages and energy policies of selected nations. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement. Prerequisite: GEOG 1002.

GEOG 2136. Water Resources. 3 Credits.
Analysis of the global spatial patterns, development, use, and quality of water resources. Prerequisite: GEOG 1002.

GEOG 2137. Environmental Hazards. 3 Credits.
Examination of environmental hazards with an emphasis on physical geography, economics, and the basics of geographic information systems (GIS).

GEOG 2140. Cities and Societies. 3 Credits.
The design and function of cities in the United States; contemporary, economic, political, and social change. Prerequisite: GEOG 1001.

GEOG 2140W. Urban Geography. 3 Credits.
The design and function of cities in the United States; contemporary, economic, political, and social change. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement. Prerequisite: GEOG 1001.

GEOG 2141. Cities in the Developing World. 3 Credits.
Urbanization processes, problems, and management in the developing world. Focus on urban location, politics, housing, services, employment, and environmental issues. Prerequisite: GEOG 1001.

GEOG 2144. Explorations in Historical Geography. 3 Credits.
Examination of selected themes in the cultural geography of the United States over the course of its history, in relation to an overview of the historical geography of the country. Same as AMST 2144.

GEOG 2147. Military Geography. 3 Credits.
An examination of environmental and locational factors and their impact on military planning and operations.

GEOG 2148. Economic Geography. 3 Credits.
Locational influences on and spatial variation of the development of manufacturing, services, trade, and finance. Prerequisite: GEOG 1001.

GEOG 2194. Special Topics in Physical Geography. 3 Credits.
Varying topics covering physical principles of the Earth's physical geography and natural environment including the hydrosphere, atmosphere, biosphere, and lithosphere. Consult the Schedule of Classes for more information. Prerequisites: permission of the instructor.

GEOG 2195. Special Topics in Human Geography. 3 Credits.
Varying topics in human geography including population, urban, cultural, political and economic issues amongst others. Consult the Schedule of Classes for additional information. Prerequisites: permission of the instructor.

GEOG 2196. Field Methods in Geography. 3 Credits.
For geography and environmental studies majors in their junior or senior year. Field research in human and physical geography. Students participate in several field exercises and develop their skills of observation, field mapping, repeat photography, and surveys. Laboratory fee.

GEOG 2197. Special Topics in Regional Geography. 3 Credits.
Varying topics in regional geography, including world regional geography as well studies of specific regions of interest. Consult the Schedule of Classes for additional information. Prerequisites: permission of the instructor.

GEOG 2199. Special Topics in Techniques. 3 Credits.
Varying topics covering specific skills in geographic information systems and field methods. Consult the Schedule of Classes for more information. Prerequisites: permission of the instructor.

GEOG 3099. Variable Topics. 1-12 Credits.

GEOG 3105. Techniques of Spatial Analysis. 3 Credits.
Quantitative methods, tools, and approaches in spatial analysis to describe and test hypotheses about observations that have a spatial component. Prerequisites: GEOG 2104; and STAT 1051 or STAT 1053.

GEOG 3106. Intermediate Geographic Information Systems. 3 Credits.
Principles of geographic information systems and their use in spatial analysis and information management. Prerequisites: GEOG 2104.

GEOG 3107. Introduction to Remote Sensing. 3 Credits.
Remote-sensing techniques using digital satellite imagery and aerial photography; application to rural and urban settings, vegetation, and environmental monitoring. Prerequisites: GEOG 3105.

GEOG 3108. Weather and Climate. 3 Credits.
Fundamental physical principles that govern the Earth's climate; the science of global climate change and the impact of anthropogenic and natural phenomenon on the climate. Prerequisite: GEOG 1002.

GEOG 3128. Geomorphology and Natural Hazards. 3 Credits.
Study of landforms and the processes that shape them; influence of landforms and processes on human activities and associated natural hazards; and the impact of humans on landscapes throughout history. Prerequisites: GEOG 1002 or GEOL 1005.

GEOG 3132. Environmental Quality and Management. 3 Credits.
The evolution of environmental management philosophies and tools. The global distribution, utilization, and degradation of natural resources. Prerequisite: GEOG 1002.

GEOG 3133. Social-Ecological Systems. 3 Credits.
Exploration of social processes and ecological dynamics by using interdisciplinary approaches that borrow tools and techniques from the social and natural sciences, as well as traditional knowledge systems. Prerequisites: GEOG 1001; and GEOG 1002 or GEOG 1003.

GEOG 3143. Urban Sustainability. 3 Credits.
Relationship between urban spaces and the environment through the lens of sustainability. Prerequisite: GEOG 1001.

GEOG 3143W. Urban Sustainability. 3 Credits.
The relationship between urban spaces and the environment, viewed through the lens of sustainability. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

GEOG 3145. Cultural Geography. 3 Credits.
Themes, concepts, and tools appropriate for an in-depth geographic examination of the Earth’s cultural landscape and of culture as a process. Prerequisite: GEOG 1001.

GEOG 3145W. Cultural Geography. 3 Credits.
Themes, concepts, and tools appropriate for an in-depth geographic examination of the Earth’s cultural landscape and of culture as a process. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement. Prerequisite: GEOG 1001. Same As: GEOG 3145.

GEOG 3146. Political Geography. 3 Credits.
The uneven distribution and exercise of political power in the world; interrelationships among the human and physical environment and political systems. Prerequisite: GEOG 1001.

GEOG 3154. Geography of the Middle East and North Africa. 3 Credits.
Cultural and physical regional patterns of the Middle East and North Africa. Prerequisites: GEOG 1001 or GEOG 1002.

GEOG 3161. Geography of Latin America. 3 Credits.
Examination of spatial characteristics of physical and cultural phenomena in Latin America.

GEOG 3164. The Geography of Africa. 3 Credits.
Human and environmental geography of Africa south of the Sahara desert, including study of patterns and processes, culture and environment, and development issues. Prerequisites: GEOG 1001 or GEOG 1002.

GEOG 3165. Geography of South Asia. 3 Credits.
An examination of the complex interplay of environmental, economic, sociocultural, and political factors in South Asia and their effects at the local and regional levels.

GEOG 3189. Readings in Geography I. 1-12 Credits.
. Prerequisites: 12 credits of geography and permission of the instructor.

GEOG 3190. Readings in Geography II. 1-12 Credits.
Continuation of GEOG 3189. Prerequisites: 12 credits of geography and permission of the instructor.

GEOG 3193. Environmental Law and Policy. 3 Credits.
An introduction to selected pieces of major environmental legislation. The role of the courts and bureaucracy in implementing and interpreting legislation and their impacts on decision making. Designed for students with no training in law Prerequisites: None.

GEOG 3194. Special Topics in Physical Geography. 3 Credits.
Topics covering physical principles of the Earth’s physical geography and natural environment including the hydrosphere, atmosphere, biosphere, and lithosphere. Enrollment requires permission of the instructor.

GEOG 3195. Special Topics in Human Geography. 3 Credits.
Topics in human geography including population, urban, cultural, political and economic issues amongst others. Enrollment requires permission of the instructor.

GEOG 3196. Special Topics in Techniques. 3 Credits.
Topics covering specific skills in geographic information systems and field methods. Enrollment requires permission of the instructor.

GEOG 3197. Special Topics in Regional Geography. 3 Credits.
Various topics in regional geography, including world regional geography as well studies of specific regions of interest. Enrollment requires permission of the instructor.

GEOG 3198. Special Topics. 3 Credits.
Consideration of geographic aspects of topical and future problems of society. May be repeated for credit provided that the topic differs. Prerequisite: GEOG 1001 or GEOG 1002.

GEOG 3218. Arctic Systems. 3 Credits.
Arctic regions examined from an interdisciplinary perspective, linking different elements of physical and human geography; Arctic climate, oceans, landscapes, and ecosystems; key issues involving interaction between humans and the environment; climate change and its effects in the Arctic. Prerequisite: GEOG 1002.

GEOG 3275. Sustainable Food Systems. 3 Credits.
The ways in which our food system impacts the environment. Human interaction with food, with emphasis on the social and environmental sustainability of these interactions.

GEOG 3810. Planning Cities. 3 Credits.
An examination of historical and contemporary trends and dynamics in urban planning in the United States and abroad. Same as AMST 3810. Prerequisite: GEOG 1001.

GEOG 4195. Proseminar in Geographic Thought. 3 Credits.
For students completing the major in geography. Development of geographic thought, theories, and methodologies; geographic curricula. Prerequisite: permission of the advisor.

GEOG 4195W. Proseminar in Geographic Thought. 3 Credits.
For students completing the major in geography. Development of geographic thought, theories, and methodologies; geographic curricula. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement. Permission of the advisor required prior to enrollment.

GEOG 4199. Internship. 1-3 Credits.
Fieldwork, internship, or other controlled assignment with an agency or organization engaged in work in applied geography. May be repeated for credit to a maximum of 6 credits. Prerequisites: 12 credits of geography courses and permission of the instructor.

GEOG 4307. Digital Image Processing and Analysis. 3 Credits.
Land use/land cover change analysis using satellite and aircraft platforms. Digital image processing techniques, analysis, and applications. Prerequisites: GEOG 2104, GEOG 3105, and GEOG 3107.

GEOG 4308. Programming for Geospatial Applications I. 3 Credits.
Fundamental concepts for creating Python scripts in ArcGIS; guidelines for proper Python syntax, troubleshooting common errors, and using loops to test for conditions and execute different code based on the results. Prerequisites: GEOG 2104, GEOG 3105, and GEOG 3106.

GEOG 4309. GIS for Emergency Management. 3 Credits.
Introduction to the theoretical principles of geographic information systems and examination of its history, current uses, and potential for emergency management through case studies, guest lectures, and hands-on training on various GIS products. Prerequisites: GEOG 3106.

GEOG 4310. Geovisualization and Cartography. 3 Credits.
Introduction to cartographic design from gathering data to the final visualization; specific components involved in mapmaking, including purpose, generalization, and symbolization. Prerequisites: GEOG 2104 and GEOG 3106. Same As: GEOG 6310.

GEOG 4311. Open Source Solutions for Geospatial Project Management. 3 Credits.
Geospatial project management, from design through implementation. Students work exclusively with open source technology for data capture, management, analysis, and communication; open source solutions and the effectiveness and sustainability of project management. Prerequisite: GEOG 3106. Same As: GEOG 6311.

GEOG 5099. Variable Topics. 1-99 Credits.

GEOG 6201. Geographic Thought. 3 Credits.
For first-year master's students, a survey of geographic thought and theories. Emphasis on contemporary issues in geography and on the development of research.

GEOG 6207. Urban Planning and Development. 3 Credits.
Selected problems in urban and regional planning: applications of zoning, environmental controls, and other techniques for achieving sustainable urban development.

GEOG 6208. Land Use and Urban Transportation Planning. 3 Credits.
Relationships between land use and the movement of goods and people. Examination of land use and transportation planning principles, issues, and techniques. Roles of public and private interests in land use and transportation planning and management.

GEOG 6218. Arctic Systems. 3 Credits.
Aspects of Arctic regions from an interdisciplinary perspective that links elements of physical and human geography; Arctic climate, oceans, landscapes, and ecosystems; interaction between humans and environment; climate change. Prerequisite: GEOG 1002.

GEOG 6219. Seminar: Climatology. 3 Credits.
Inadvertent climate modification due to urbanization and impacts on environmental and human health.

GEOG 6220. Seminar: Climatic Change. 3 Credits.
Examination of natural and human-induced climatic change, at global, regional, and local scales.

GEOG 6222. Seminar: Resources and the Environment. 3 Credits.
Topics related to the spatial variations and interrelationships of resources and the environment; applications of geographic information systems and remote sensing. Prerequisite: permission of instructor.

GEOG 6223. Seminar: Population and Health. 3 Credits.
Interrelationships between population characteristics and dynamics and impacts on human health.

GEOG 6224. Seminar: Political Geography. 3 Credits.
Examination of political factors in location theory and analysis of the nature of political territories and conflict.

GEOG 6225. Seminar: Transportation and Development. 3 Credits.
Transportation and communication in the organization of space.

GEOG 6226. Water Resources Policy and Management. 3 Credits.
The history and practice of water resources policy and management in an integrated context; the impact of urban and agricultural runoff on water quality; provision of wastewater and water quality services; water supply, water allocation, and scarcity; and modification of waterbodies for the purposes of flood control, hydropower, navigation, and recreation.

GEOG 6230. Seminar: Environmental Issues in Development. 3 Credits.
A consideration of the geographical dimensions of the links between development and the environment.

GEOG 6232. Migration and Development. 3 Credits.
Analysis of migration's impact on development at various scales for both the sending and receiving localities.

GEOG 6233. Social-Ecological Systems. 3 Credits.
Exploration of social processes and ecological dynamics using interdisciplinary approaches that borrow tools and techniques from the social and natural sciences and traditional knowledge systems.

GEOG 6243. Seminar: Urban Geography. 3 Credits.
Topics concerning social, political, economic, and environmental issues in U.S. cities.

GEOG 6244. Urban Sustainability. 3 Credits.
Urban sustainability and environmental issues in developed and developing cities.

GEOG 6245. Water Resources Policy and Management. 3 Credits.
This course examines the history and practice of water resources policy and management in the context of integrated water resource management. Thus, the course addresses management issues and policy responses to such topics as the impacts of urban and agricultural runoff on water quality; provision of wastewater and water quality services; water supply, water allocation and scarcity; and modification of waterbodies for the purposes of flood control, hydropower, navigation, and recreation. In addition, non-human water requirements: e.g. for fish and wildlife, as well as the need to preserve the natural ecosystems that provide and sustain water resources are central to each discussion. Management and policy issues in the United States and worldwide at a range of scales (local, state, federal and international) will be examined. In the course of these examinations, students gain an understanding of how current issues such as growing populations, increasing affluence, and climate change may impact water resource policy and management.

GEOG 6250. Geographical Perspectives on Development. 3 Credits.
Theory and debates surrounding economic development in a globalizing world, with case studies.

GEOG 6261. Geographical Perspectives on Latin America. 3 Credits.
Natural resources, the environment, and population dynamics through time.

GEOG 6262. Geographical Perspectives on the Middle East. 3 Credits.
Examination of selected topics related to political, economic, social, cultural, and geographic patterns and processes in the region.

GEOG 6265. Geography of Russia and Its Neighbors. 3 Credits.
A deeper understanding of Post-Soviet geography with a focus on the physical and environmental characteristics of the region, geography of natural and human resources, ethnic, cultural and religious diversity, characteristics of economic and political regions, and recent geopolitical developments.

GEOG 6290. Principles of Demography. 3 Credits.
Introduction to basic demographic perspectives and data; methods for analysis of population size, distribution, and composition; determinants and consequences of population trends. Departmental prerequisite waived. Same as ECON 6290/ SOC 6290/ STAT 6290.

GEOG 6292. Qualitative Methods in Geography. 3 Credits.
Qualitative research methods, including questionnaires, focus groups, in-depth interviews, repeat photography, observation, reflective mapping, coding, and map interpretation that help appreciate the human experience and build upon ways to produce knowledge.

GEOG 6293. Special Topics. 3 Credits.
Consideration of geographic aspects of topical social or environmental problems. May be repeated for credit provided the topic differs. Credit cannot be earned for this course and IAFF 6118.

GEOG 6295. Research. 1-12 Credits.
May be repeated for credit.

GEOG 6299. Internship. 1-3 Credits.

GEOG 6300. Geography Capstone Internship. 3 Credits.
This course provides hands-on experiential learning in a local government agency, NGO, or corporation while allowing the candidate to use his/her geographical skills in a real world setting. Restricted to graduate students in the geography program. Prerequisite: GEOG 6201.

GEOG 6303. Introduction to Remote Sensing. 3 Credits.
Theoretical, technical, and applied aspects of remote sensing as a tool for monitoring and managing Earth's resources.

GEOG 6304. Geographical Information Systems I. 3 Credits.
Fundamentals of cartography; geographic data structure and geographic information systems.

GEOG 6305. Geospatial Statistics. 3 Credits.
Nature of geographical inquiry and the analytical and statistical methods used in the study of spatial processes and patterns.

GEOG 6306. Geographical Information Systems II. 3 Credits.
Advanced principles of geographic information systems and their use in spatial analysis and information management. Prerequisites: GEOG 6304 and GEOG 6305.

GEOG 6307. Digital Image Processing. 3 Credits.
This course introduces students to the theoretical, technical and applied aspects of remote sensing as a tool for monitoring and managing earth resources. This course provides students with the knowledge for analyzing and applying remotely sensed data for problem solving as it applies to land cover. Prerequisite: GEOG 6304.

GEOG 6308. Programming for Geospatial Applications. 3 Credits.
Fundamental concepts for creating Python scripts in ArcGIS; guidelines for proper Python syntax, techniques to troubleshoot common errors, and using loops to test for conditions and execute code based on results. Prerequisites: GEOG 6304 and GEOG 6305.

GEOG 6309. GIS for Emergency Management. 3 Credits.
This course introduces students to the theoretical principles of geographic information systems and examines its history, current uses and potential for emergency management through case studies, guest lectures and hands-on training on various GIS products. Prerequisite: GEOG 6304.

GEOG 6310. Geovisualization and Cartography. 3 Credits.
Introduction to cartographic design; components of mapmaking, including purpose, generalization, and symbolization; spatial thinking and effective audience-specific communication Prerequisite: GEOG 6304.

GEOG 6311. Open Source Solutions for Geospatial Project Management. 3 Credits.
Geospatial project management, from design through implementation. Students work exclusively with open source technology for data capture, management, analysis, and communication; open source solutions and the effectiveness and sustainability of project management. Prerequisite: GEOG 6304. Same As: GEOG 4311.

GEOG 6999. Thesis Research. 3,6 Credits.
Development of a thesis project and accompanying research.