GEOGRAPHY

Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.
More Info (https://one.uf.edu/soc/)

Unless otherwise indicated in the course description, all courses at the University of Florida are taught in English, with the exception of specific foreign language courses.

Department Information

The Geography Department offers a range of topics in contemporary geography and geospatial science, rich and lively cultural and learning environments, BA and BS undergraduate degrees, MA, M.S., and PhD degrees, as well as the largest Medical Geography program in the United States.
Website (https://geog.ufl.edu/)

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Map (http://campusmap.ufl.edu/#/index/0267)

Curriculum

- Combination Degrees
- GeoAI and Geographic Analysis Minor
- Geographic Artificial Intelligence and Big Data Certificate
- Geography
- Geography Minor
- Geography Minor UF Online
- Geography UF Online
- Geospatial Information Analysis Certificate
- Medical Geography Certificate
- Medical Geography in Global Health Minor
- Meteorology and Climatology Certificate
- Meteorology Minor

Courses

GEA 1000 Geography for a Changing World 3 Credits
Grading Scheme: Letter Grade
The spatial organization of society. Emphasizes the political regions of the world. (N)
Attributes: General Education - International

GEA 1050 Prisoners of Geography: 10 Maps That Explain Everything About the World 3 Credits
Grading Scheme: Letter Grade
Introduces the ways in which international affairs can be understood through geographical factors: not just the physical landscape (the natural barriers of mountains or connections of river networks, for example), but also climate, demographics, biogeography, environment, cultural regions, and access to natural resources. Utilizing maps, works to explain and understand complex geopolitical landscapes that shape our world in an ever more complex, chaotic, and interlinked manner.

GEA 2270 Geography of Florida 3 Credits
Grading Scheme: Letter Grade
Geographic conditions and human adjustments in the major regions in Florida. The natural environment, population, routes of communication, industries, resources and strategic location in their geographical and historical aspects. (WR)
Attributes: Satisfies 6000 Words of Writing Requirement

GEA 2601 Geography of Africa 3 Credits
Grading Scheme: Letter Grade
Survey of the population, natural resources, geographic regions, and potentialities of Africa; the significance of this region in the economic and political affairs of the world.
Attributes: General Education - International, General Education - Social Science, Satisfies 6000 Words of Writing Requirement

GEA 3405 Geography of Latin America 3 Credits
Grading Scheme: Letter Grade
Examines the interconnecting land, life, and welfare throughout Latin America.
Prerequisite: Sophomore standing or higher.
Attributes: Satisfies 6000 Words of Writing Requirement

GEA 3500 Geography of Europe 3 Credits
Grading Scheme: Letter Grade
Comprehensive and systematic survey of the population, natural resources, geographic regions, and potentialities of Europe and the significance of this region in the economic and political affairs of the world.
Prerequisite: Sophomore standing or higher.
Attributes: General Education - International

GEA 4465 Amazonia 3 Credits
Grading Scheme: Letter Grade
Biophysical basis of natural resource management, cultural diversity, and economic development in Amazonia. Appreciating the complexity and variability of soils, vegetation, aquatic ecosystems, and climate in the region offers clues for understanding human settlement and development, as well as the potential and limitations of the rich natural resource base.
Prerequisite: Sophomore standing or higher.

GEA 4911 Undergraduate Research in Regional Geography 0-3 Credits
Grading Scheme: Letter Grade
Provides firsthand, supervised research in Regional Geography. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Regional Geography.

GEO 2002 Why Geography Matters: More Than Ever 3 Credits
Grading Scheme: Letter Grade
Introduces global transformations of all kinds: intense climate change significant weather extremes; unprecedented terrorist attacks; costly wars in Iraq Afghanistan; a terrible overlooked conflict in Equatorial Africa; an economic crisis threatening the stability of the international system. Presents these events their interconnections. Places our turbulent world in a more understandable light.

GEO 2006 Natural Hazards Geography 3 Credits
Grading Scheme: Letter Grade
Examines global weather, climate, and geophysical hazard events through geographic lens of human-environment interactions to understand how disasters emerge not only due to extreme events but from complex social, cultural, psychological, political, and economic forces. Discusses historical, recent, and ongoing hazard events to connect theory to individual and shared experiences.
Attributes: General Education - International, General Education - Social Science

GEO 2200 Dynamic Planet Earth 3 Credits
Grading Scheme: Letter Grade
A study of the development and distribution of landforms, climates, minerals, soils and water resources. Interrelationships among the physical environment and regional patterns formed by these elements are analyzed against man's utilization of them. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: General Education - Physical Science

GEO 2200L Dynamic Planet Earth Laboratory 1 Credit
Grading Scheme: Letter Grade
Laboratory in physical geography. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Corequisite: GEO 2200 or GEO 2201.
Attributes: General Education - Physical Science

GEO 2230 Living with Rising Seas 3 Credits
Grading Scheme: Letter Grade
Examines the complex relationship between people and coastlines by asking “How will humanity adapt to sea level rise?” Connects the science of sea level rise and coastal change to the built and natural environment and societal impacts, while considering actionable solutions for developing sustainable and equitable coastal futures.
Prerequisite: Any Quest 1 course with a minimum grade of C.
Attributes: Quest 2, General Education - Physical Science

GEO 2242 Extreme Weather 3 Credits
Grading Scheme: Letter Grade
Introduction to science of weather and climate and current scientific developments in such areas as extreme weather prediction, global climate change and improved forecasting of events. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: General Education - Physical Science

GEO 2301 The Next Pandemic 3 Credits
Grading Scheme: Letter Grade
Focuses on historic and modern disease outbreaks, in order to hypothesize what the next pandemic will be. We will ask what social, political, biological, and environmental factors led to historic outbreaks, what happened when we faced a new pandemic, and how can we prepare for the next pandemic? This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - Physical Science

GEO 2315 Hungry Planet: Global Geographies of Food 3 Credits
Grading Scheme: Letter Grade
This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena through an overview of the biological structure, means of survival, propagation and distribution of plants, with emphasis on their relationship to the culture and diffusion of man through the world and his part in their development and improvement. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: General Education - Biological Science

GEO 2351 Geographical Sciences and Sustainability 3 Credits
Grading Scheme: Letter Grade
Examines the most critical environmental issues facing the world today; emphasizes the sustainability of both human and physical systems in the 21st century utilizing cutting-edge geographic technologies: spatial analysis, GIS, and satellite imagery.
Prerequisite: any Biological Sciences or Physical Sciences General Education course.
Attributes: Artificial Intelligence

GEO 2410 Social Geography 3 Credits
Grading Scheme: Letter Grade
Introduces geography as a social science. Various social concepts presented from a spatial perspective.

GEO 2411 Geographies of Race 3 Credits
Grading Scheme: Letter Grade
Addresses geography as a colonial discipline. Introduces works on race that included plans to control, extract resources from, and convert non-European populations. Engages research on race and ethnicity produced in the field of geography. Analyzes the field's imperial roots and progress thematically in the context of contemporary approaches to the study of racialized communities. Presents approaches to the study of race, racism and resistance in the field of geography

GEO 2420 People, Place, and Culture 3 Credits
Grading Scheme: Letter Grade
Introduces cultural geography with an emphasis upon the development and spatial arrangement of the major societies of the modern world. (N)
Attributes: General Education - International

GEO 2426 Pop Music and Culture: a Geographic Perspective 3 Credits
Grading Scheme: Letter Grade
Examines the geographic origins, development and diffusion of contemporary pop music and the regional dynamics of pop music culture from the 1950s to present. (S)
Attributes: General Education - Social Science

GEO 2500 Global and Regional Economies 3 Credits
Grading Scheme: Letter Grade
This course explores contemporary perspectives, themes, and research in economic and political geography focusing on events and issues associated with regional and global economic and demographic change. Regional variations and disparities in growth and development are analyzed, and policy implications discussed.
Attributes: General Education - Social Science, Satisfies 6000 Words of Writing Requirement

GEO 2530 The Future of Energy 3 Credits
Grading Scheme: Letter Grade
The future of energy takes the students on a journey through the history of energy use, issues associated with different technologies, and future challenges and opportunities. The course brings up pressing questions such as is renewable energy always sustainable? Are renewable energies always a better option for the environment? And what does a future sustainable energy situation look like? And challenges the students to find the answers to these questions via a combination of readings, lectures, discussions and reflection. The course also explores geographic differences between different states, countries and societies, which contributes to shaping the energy landscape now and in the future.
Attributes: Quest 2, General Education - Physical Science

GEO 3162C Introduction to Quantitative Analysis for Geographers 4 Credits
Grading Scheme: Letter Grade
Introduces elementary geographical data analysis, including spatial measurement, spatial statistics, and spatial forecasting. Apply statistical concepts and the use of spreadsheet computer software.
Prerequisite: STA 2023 or instructor permission.

GEO 3222 Sea Level Science 3 Credits
Grading Scheme: Letter Grade
Explains how sea level changes in space and time. Topics include methods for measuring sea level, the causes of sea level change such as tides, storms, and climate, future projections of sea level change, and resulting impacts.
Prerequisite: GEO 2200 or GLY 2010C or instructor permission.

GEO 3250 Climatology 3 Credits
Grading Scheme: Letter Grade
Genesis of regional climates and their global distribution. Emphasis on world regional climatology. Secondary topics include applied climatology and climate change.
Prerequisite: MET 1010 or GEO 2200 or GEO 2242.

GEO 3280 Principles of Geographic Hydrology 4 Credits
Grading Scheme: Letter Grade
Examines the effects of physical geography on the land-based portion of the hydrologic cycle at the regional and basin scales. Includes discussion of precipitation, infiltration, and runoff.
Prerequisite: GEO 2200 or instructor permission;
Corequisite: GEO 3162C.

GEO 3320 International Wildlife Policy - Lessons from Africa 3 Credits
Grading Scheme: Letter Grade
Introduces the challenge of wildlife conservation on a peopled planet. With wildlife declining globally under conventional (exclusionary) policies, this course analyses why wildlife is recovering through new (inclusionary) policies of wildlife utilization, ownership, and democratization. Discusses the governance and political economy of parks, private, and community conservation in Africa, and strategies like tourism, trophy hunting, wildlife trade, and anti-poaching.
Prerequisite: Sophomore standing or higher.

GEO 3334 Managing for a Changing Climate 3 Credits
Grading Scheme: Letter Grade
Interdisciplinary survey of climate variability and change. Topics include the physical science basis for climate change, sectoral analysis of climate impacts, adaptation, and mitigation options. Active learning, discussions, and roleplaying facilitate understanding of critical issues facing the human and natural world.
Prerequisite: Any P, B General Education Course
Attributes: Satisfies 4000 Words of Writing Requirement

GEO 3341 Extreme Floods 3 Credits
Grading Scheme: Letter Grade
Examines the world's most extreme floods from the Pleistocene through present due to various causes. Discusses physical and human aspects of flood warning, preparedness, response, and recovery throughout the world.
Prerequisite: Sophomore standing or higher.
Attributes: General Education - International

GEO 3343 Extreme Droughts 3 Credits
Grading Scheme: Letter Grade
Examines droughts, particularly hydrologic droughts and drying rivers, and declining water resources. Assesses biophysical, socio-economic consequences when the quantity or quality of water is limited and/or decreasing through case studies in different environments (rivers, lakes, groundwater, etc.) and countries through data analysis and projects.
Prerequisite: Junior or senior standing.

GEO 3352 The Human Footprint on Landscape 3 Credits
Grading Scheme: Letter Grade
Studies human-environment relationships from a primarily geographic perspective, focusing on the human forces that shape landscapes.
Prerequisite: Sophomore standing or higher.

GEO 3372 Conservation of Resources 3 Credits
Grading Scheme: Letter Grade
Surveys natural resources and a study of wise and wasteful practices of these resources. Satisfies resource certification for social studies teachers.
Prerequisite: Sophomore standing or higher or instructor permission.

GEO 3427 Plants, Health and Spirituality 3 Credits
Grading Scheme: Letter Grade
Issues and controversies surrounding organic food, genetically modified crops, medicinal plants, plants used to achieve altered states of consciousness, and the importance of ornamental plants as inspiration for artists and in worship.
Prerequisite: Sophomore standing or higher.

GEO 3430 Population Geography 3 Credits
Grading Scheme: Letter Grade
Geographical analysis of populations, including population description, distribution, change, and characteristics; demographic processes; and the consequences of development, conflict, and population control diseases.
Prerequisite: Sophomore standing or higher.

GEO 3452 Introduction to Medical Geography 3 Credits
Grading Scheme: Letter Grade
Medical geography deals with human-environment interactions and the influence of these interactions on public health. Provides a broad and comprehensive survey of geographic approaches in medical studies.
Prerequisite: sophomore standing or higher; entry-level knowledge of statistics (STA 2023 or GEO 3162C or equivalent) recommended.

GEO 3454 Peoples and Plagues 3 Credits
Grading Scheme: Letter Grade
Introduces emerging infectious diseases (EIDs) in the context of previous outbreaks, focusing on geography, origin, and management response. Explores basic models of infectious diseases processes, transmission cycled, and life-histories of host-vector systems, and the ecological and landscape conditions that favor emergence.
Prerequisite: Sophomore standing or higher.

GEO 3502 Economic Geography 3 Credits
Grading Scheme: Letter Grade
Comprehensive geographical survey of major economic activities such as agriculture, forestry, fishing, mining, manufacturing, and commerce. Emphasizes the study of the characteristics of distribution and the regional patterns of these activities.
Prerequisite: Sophomore standing or higher.
Attributes: Satisfies 6000 Words of Writing Requirement

GEO 3602 Urban and Business Geography 3 Credits
Grading Scheme: Letter Grade
Empirical and theoretical spatial analysis of the various economic, population and social facets within and between urban settlements.
Prerequisite: Sophomore standing or higher or instructor permission.
Attributes: Satisfies 6000 Words of Writing Requirement

GEO 3611 Housing, People, and Places in a Spatially Diverse America 3 Credits
Grading Scheme: Letter Grade
Examines the housing, people, and places that comprise the diverse contemporary human settlement patterns in the US. Topics focus on the quality of life found in the housing and neighborhoods of these urban and rural landscapes.
Prerequisite: Sophomore standing or higher.

GEO 3803 Geography of Alcohol 3 Credits
Grading Scheme: Letter Grade
Origins and fission of alcoholic beverages and associated crops on a global scale.
Prerequisite: Sophomore standing or higher.

GEO 3930 Special Topics in Geography 3 Credits
Grading Scheme: Letter Grade
Rotating topics in geography.
Prerequisite: Sophomore standing or higher.

GEO 4024C Terrorism and Space 4 Credits
Grading Scheme: Letter Grade
Critically discusses the dual concerns for geography as an influence on and a source of terrorism. Presents the origins of contemporary terrorism as well as the various motivations of ideologically-oriented, ethno-nationalist, and religious organizations. Examines how a spatial approach can contribute to better understand the diffusion of terrorist organizations across the world, with a particular focus on Africa.
Prerequisite: Any course with a GIS prefix.

GEO 4033 Climate Change and Health 3 Credits
Grading Scheme: Letter Grade
Presents the science of climate change and impacts on health. Discussion builds on core concepts of climate change science to examine a variety of topics from acute impacts such as heat waves and other weather extremes to chronic conditions like degraded air quality. Mitigation and adaptation strategies are also discussed.
Prerequisite: GEO 2200 or GEO 2242 or MET 1010 or permission of instructor.

GEO 4034 Weather, Climate, and Society 3 Credits
Grading Scheme: Letter Grade
Investigates social vulnerability to hazards, disasters, and climate change through perspectives and experiences of vulnerable population segments who often bear brunt of losses yet exhibit remarkable flexibility and creativity in coping and adapting to environmental risks. Introduces census data and spatial analysis to understand geographies of social vulnerability
Prerequisite: GEO 2006 or GEO 2200 or GEO 2242 or GEO 2420 or GEO 2410 or GEO 3430.

GEO 4060 People and Parks 3 Credits
Grading Scheme: Letter Grade
Introduces global protected area management. Describes history of protected areas on several continents and discusses how international definitions of protected area objectives match the rapidly changing needs of society. Broadens the idea of protected areas to discuss private and community conservation. Introduces inclusive conservation. Takes students through a process of assessing the sustainability of parks from a biological, economic, social, and institutional perspective.
Prerequisite: Sophomore standing.

GEO 4167C Intermediate Quantitative Analysis for Geographers 3 Credits
Grading Scheme: Letter Grade
Surveys various multivariate techniques commonly used to analyze geographic data. Emphasis on hypothesis testing, inference, multiple regression, analysis of variance and cluster analysis. Introduces time-series regression and grouped estimation procedures, factor analysis, probit/logit modeling and trend-surface interpolation. (WR)
Prerequisite: GEO 3162C or the equivalent.
Attributes: Artificial Intelligence, Satisfies 6000 Words of Writing Requirement

GEO 4169 Spatial Econometrics and Modeling 3 Credits
Grading Scheme: Letter Grade
Introduces regression models capable of dealing with spatial auto-correlation; develop statistical models and estimate with computer software.
Prerequisite: GEO 4167C or equivalent.
Attributes: Artificial Intelligence

GEO 4170 Communicating Science in the Geosciences 3 Credits
Grading Scheme: Letter Grade
Examines techniques to communicate scientific knowledge and research to non-science audiences. Topics include quantitative and qualitative research methods, using narrative, discussing data and statistics, risk communication, and communicating with journalists and politicians. Readings, discussions, and projects facilitate understanding of best practices when communicating to people making evidence-based decisions.
Prerequisite: Any Gen Ed Biological or Physical Sciences course.

GEO 4281 River Forms and Processes 3 Credits
Grading Scheme: Letter Grade
Examines the nature and variety of fluvial processes and the origin and modification of fluvial landforms. Includes discussion of environmental changes in rivers and human activities in drainage basins.
Prerequisite: GEO 2200 or GLY 2010C, or instructor permission.

GEO 4285 Water, Risk, and Extreme Events 3 Credits
Grading Scheme: Letter Grade
Investigates techniques for evaluating the risks of extreme events related to water in our environment. Presents data and methodologies for estimating the rarity of phenomena including excessive rainfall totals, high and low river levels, coastal storm surge and waves, and drought.
Prerequisite: GEO 3162C or STA 3032 or permission of instructor.
Attributes: Artificial Intelligence, Satisfies 6000 Words of Writing Requirement

GEO 4300 Environmental Biogeography 3 Credits
Grading Scheme: Letter Grade
Description and explanation of spatial patterns of biodiversity and the underlying biophysical factors of human-environment interactions. Investigates past and present distributions of organisms and how patterns of environmental variation influence organisms. How biogeography is used to design nature reserves and how forecasting climate change may affect organisms and explain human adaptations to environmental variability.
Prerequisite: Any Gen. Ed. P or B course.

GEO 4306C Geography of Vector-borne Diseases 3 Credits
Grading Scheme: Letter Grade
Introduces the spatial epidemiology of vector-borne diseases (VBDs) and geospatial methods for monitoring, mapping and modeling them. Provides hands-on experiences for mapping and modeling risk of VBDs via GIS-based labs.
Prerequisite: GEO 3452 or GIS 3043 or permission of the instructor.
Attributes: Artificial Intelligence

GEO 4554 Regional Development 3 Credits
Grading Scheme: Letter Grade
Problems of regional development and regional growth within the context of economic, political, and spatial relationships.
Prerequisite: Junior standing or higher.

GEO 4612 Shelter and Care Options for US Elderly 3 Credits
Grading Scheme: Letter Grade
Examines the strengths, weaknesses, and demand for housing and care alternatives addressing the needs of both active and frail American elderly persons.
Prerequisite: refer to the department.

GEO 4700 Transportation and Urban Accessibility 3 Credits
Grading Scheme: Letter Grade
Investigates the relationship between transportation and urban accessibility from a geographic perspective, through the examination of the impacts of transportation systems and accessibility on human health, social equity, and the environment, as well as the methods and tools for modeling and analyzing transportation systems and accessibility.
Prerequisite: Sophomore standing or higher.

GEO 4905 Individual Work 1-5 Credits
Grading Scheme: Letter Grade
Qualified students and the instructor concerned may choose a particular topic or problem for study.
Prerequisite: undergraduates only with 9 credits of geography and instructor permission.

GEO 4911 Undergraduate Research in Geography 0-3 Credits
Grading Scheme: Letter Grade
Provides firsthand, supervised research in Geography. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Geography.

GEO 4930 Senior Seminar 1 Credit
Grading Scheme: Letter Grade
Integrates geographic concepts for graduating seniors; provides introduction to professional geography for students entering the job market.
Prerequisite: geography seniors only.

GEO 4938 Selected Topics in Geography 1-4 Credits
Grading Scheme: Letter Grade
Rotating geography topics.
Prerequisite: Sophomore standing or higher.

GEO 4944 Internship 1-10 Credits
Grading Scheme: Letter Grade
Experimental learning in position with city, county, regional and state government agencies.
Prerequisite: Senior standing or higher.

GEO 4970 Honors Thesis 3 Credits
Grading Scheme: Letter Grade
Completion of an honors thesis that meets department specifications during the semester in which the student is enrolled.
Prerequisite: senior standing and participation in department honors program.

GIS 2002 The Digital Earth 3 Credits
Grading Scheme: Letter Grade
Focuses on how the Earth's surface is visualized, explored, and analyzed in digital formats (e.g. maps, satellite images, aerial photos). Provides an introduction to fundamental concepts of digital geographic data to understand the Earth environment and human society based on the vast quantities of geographic information in our ever-changing world.
Attributes: Artificial Intelligence

GIS 2114 The World & Big Data 3 Credits
Grading Scheme: Letter Grade
Data drives today's world and over 80% of that data is geographic. Increasing volume and varying formats of these geospatial big datasets have posed new challenges. Introduces relevant concepts (e.g., 5 V's) and techniques (e.g., cloud computing) of big (spatial) data as well as its applications in the real world. Hands-on experiences with Volunteered Geographic Information (VGI), analyzing geotagged tweets, and visualizing spatial datasets.

GIS 3001C Geovisualization and Map Design 4 Credits
Grading Scheme: Letter Grade
Analyzes cartographic problems with exercises in techniques of presentation, including map projections and symbols and problems in statistical representation by graphic methods.
Prerequisite: Sophomore standing or higher.

GIS 3043 Foundations of Geographic Information Systems 4 Credits
Grading Scheme: Letter Grade
Geographic Information Systems (GIS) as the technology for creation, modification, display, and analysis of spatial information. Develops knowledge of GIS, competence in geographic databases, and familiarity with computer software and hardware.
Prerequisite: Sophomore standing or higher.
Attributes: Artificial Intelligence

GIS 3420C GIS Models for Public Health 3 Credits
Grading Scheme: Letter Grade
Focuses on the design of GIS-based models to address health and healthcare issues. Topics include a conceptual framework, landscape epidemiology models, disease diffusion models, health accessibility, human health behavior and location-allocation of health services. Laboratory section provides hands-on experience applying these models with GIS tools.
Prerequisite: (GIS 3043 or equivalent) & (STA 2023 or GEO 3162C or equivalent) or (Instructor permission)
Attributes: Artificial Intelligence

GIS 4021C Aerial Photo Interpretation 3 Credits
Grading Scheme: Letter Grade
Principles of aerial photography, identification and interpretation of physical and cultural features, sketching and simple map-making, and uses of aerial photography.
Prerequisite: GEO 2200 or instructor permission.

GIS 4037 Digital Image Processing 4 Credits
Grading Scheme: Letter Grade
Introduces the theory and application of digital imagery data in geographical research with a hands-on, lab-based approach.
Prerequisite: Junior standing or higher.
Attributes: Artificial Intelligence

GIS 4102C GIS Programming 3 Credits
Grading Scheme: Letter Grade
Introduces basic programming concepts; instruction in popular programming languages for geospatial processing, applications, and modeling in ArcGIS environment.
Prerequisite: GIS 3043C or equivalent.
Attributes: Artificial Intelligence

GIS 4113 Introduction to Spatial Networks 3 Credits
Grading Scheme: Letter Grade
Many phenomena of interest in physical, social and cyber environments can be thought of as networks within geographic context. Teaches methods for analyzing these spatial networks, and introduces their applications in geography, transportation, hydrology, epidemiology, social science, etc.
Prerequisite: Entry level knowledge of statistics or instructor permission. Prior experience with ArcGIS is preferred.
Attributes: Artificial Intelligence

GIS 4115C Spatial Surface Modeling and Geostatistics 3 Credits
Grading Scheme: Letter Grade
Teaches principles for modeling and analyzing surfaces of geographic features, such as terrain, temperature, and diseases, with an emphasis on geostatistical (or kriging) analysis. Provides hands-on experiences of using ArcGIS Geostatistical Analyst through lab exercises.
Prerequisite: (STA 2023 or GEO 3162C or equivalent) and GIS 3043 or equivalent or instructor permission.
Attributes: Artificial Intelligence

GIS 4123C GeoAI – Geographic Artificial Intelligence 3 Credits
Grading Scheme: Letter Grade
Integration of Geography and AI, or GeoAI (a subfield of spatial data science), provides novel approaches for addressing a variety of geospatial problems in the natural environment and our human society. Hands-on computing labs using real-world geospatial data to address such AI topics as: image classification, object detection, scene segmentation, simulation and interpolation, retrieval and question answering, on-the-fly data integration, and geo-enrichment.
Prerequisite: Any 3000 level or higher GIS prefix course [GIS3XXX, GIS4XXX] or permission of instructor.
Attributes: Artificial Intelligence

GIS 4124 Geocomputation using R Programming 3 Credits
Grading Scheme: Letter Grade
Introduction to geodata analysis using programming. Broad introduction to the programming language as well as applied spatial data analysis. Facilitates students' use of programming to analyze data of their own choosing on a final project. Code sharing and re-use is highly emphasized, as is collaboration.
Prerequisite: Any 3000 level or higher GIS prefix course or permission of instructor.

GIS 4324 GIS Analysis of Hazard Vulnerability 3 Credits
Grading Scheme: Letter Grade
Geographic and cartographic techniques for geospatial analysis of risk, vulnerability, and resilience using ArcGIS. Learn to utilize physical and human geographic datasets for multiple hazard contexts including hydrometeorological, climatological, and geophysical hazards.
Prerequisite: GIS 3043 or URP 4273 with minimum grade of C.
Attributes: Artificial Intelligence

GIS 4424C Applications in GIS for Zoonoses and Disease Ecology 3 Credits
Grading Scheme: Letter Grade
Focuses on GIS applications in spatial analysis and ecology to address common research issues related to zoonotic diseases which affect animals and humans.
Prerequisite: GIS 3043 or GIS 3420C, or equivalent.

GIS 4500 Population GIS 3 Credits
Grading Scheme: Letter Grade
Instruction on geographic and cartographic techniques for geospatial analysis of population, demographic, and socioeconomic data using ArcGIS Pro. Students identify and utilize current and historical secondary population data sources for GIS analysis of population changes, and for mapping of segregation, inequality, and well-being indicators.
Prerequisite: GIS 3043 or GIS 3001C or URP 4273 with minimum grades of C, or GEO 3430 or SYD 4020.
Attributes: Artificial Intelligence

GIS 4911 Undergraduate Research in Geospatial Trends 0-3 Credits
Grading Scheme: Letter Grade
Provides firsthand, supervised research in Geospatial Trends. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Geospatial Trends.

GLY 4734 Coastal Morphology and Processes 3 Credits
Grading Scheme: Letter Grade
Examines the nature and variety of coastal processes, and the origin and modification of environmental changes along coasts, including human activities in the coastal zone.
Prerequisite: GEO 2200 or GLY 2010C or GLY 2030C.

MET 1010 Introduction to Weather and Climate 3 Credits
Grading Scheme: Letter Grade
This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: high school algebra.
Attributes: General Education - Physical Science

MET 3300 Atmospheric Dynamics 3 Credits
Grading Scheme: Letter Grade
Covers the principles of physics that govern atmospheric behavior. Dynamic introduces the equations that express the fluid dynamics principles for the atmosphere and the ways of simplifying, interpreting, and applying those equations to understand observed atmospheric motions, particularly on synoptic scales.
Prerequisite: MAC 2312 and PHY 2048

MET 3503 Weather and Forecasting 3 Credits
Grading Scheme: Letter Grade
Provides hands-on experience using weather instruments and making forecasts.
Prerequisite: GEO 2242 or MET 1010 or GEO 2200.

MET 3753 Pragmatic Python for Weather 3 Credits
Grading Scheme: Letter Grade
Provides a fundamental understanding of the Python programming language with a core focus on ingesting, displaying, and analyzing observational meteorological data and numerical weather model data.
Prerequisite: MET 1010 or GEO 2242.

MET 4224C Machine Learning in Meteorology 3 Credits
Grading Scheme: Letter Grade
Hands-on experiences with Machine Learning (ML) from a series of practical case-studies in meteorology. Regression, classification, clustering and retrieval, and deep learning to solve research questions by identifying potential applications of ML, selecting appropriate ML models, representing data as features to serve as input to ML models, and assessing model quality
Prerequisite: Any 3000 level or higher MET prefix course or permission of instructor.

MET 4230 Thermodynamics of the Atmosphere 3 Credits
Grading Scheme: Letter Grade
Detailed survey of atmospheric thermodynamics, which deals with energy transfers and processes involving moisture and stability that affect atmospheric motions and weather systems. Lecture material reinforced and supplemented through lab exercises. This topic is for those who intend to pursue a profession in meteorology, physics, atmospheric/climate science, or engineering.
Prerequisite: MET 3503 and CHM 2045 and MAC 2312 and PHY 2048/L with minimum grades of C.

MET 4301 Atmospheric Dynamics 1 4 Credits
Grading Scheme: Letter Grade
This course covers the forces that govern atmospheric motion; acceleration in rotating curvilinear coordinates; momentum, continuity, and energy equations; scale analysis; geostrophic, gradient, and thermal winds; natural coordinates; circulation and vorticity theorems; Reynolds stresses; Prandtl and Ekman layers; and developing baroclinic systems.

MET 4410 Radar and Satellite Meteorology 3 Credits
Grading Scheme: Letter Grade
Overview of radar and satellite remote sensing as used in the atmospheric sciences, including the principles of atmospheric radiative transfer, the retrieval of atmospheric variables, and emphasis on geospatial interpretation of imagery for different weather systems.
Prerequisite: PHY 2049 and MET 3503.
Attributes: Artificial Intelligence

MET 4450 Atmospheric Physics 3 Credits
Grading Scheme: Letter Grade
Technical and theoretical evaluation of radiative and microphysical properties of the atmosphere, clouds, and precipitation. Course includes radiative transfer processes fundamental to Earth's climate system, and key hypotheses regarding the development of cloud and precipitation, using mathematical principles to understand how droplets condense and grow.
Prerequisite: MAC 2312 with minimum grade of C and CHM 2045 with minimum grade of C and PHY 2048L with minimum grade of C and MET 3503 with minimum grade of C.

MET 4500C Synoptic Meteorology 4 Credits
Grading Scheme: Letter Grade
Comprehensive survey of mid-latitude storm systems using conceptual and theoretical frameworks established through lecture material, and application of these concepts through immersive labs. Content includes atmospheric circulation, mid-latitude cyclones, fronts, jet streams, winter weather and severe storm environments. Appropriate for students seeking a career in atmospheric science or related field.
Prerequisite: MET3503 and CHM 2045 and MAC 2312 and PHY 2048/L with minimum grades of C.

MET 4524 Weather Briefing 1 Credit
Grading Scheme: S/U
Learn to prepare and present a daily weather briefing. Briefings will demonstrate the ability to synthesize weather information on all scales, prepare a forecast, and communicate this clearly and succinctly to an audience.
Prerequisite: MET 4500C with a C grade or better.

MET 4531 Mesoscale Meteorology 3 Credits
Grading Scheme: Letter Grade
Covers the major dynamic and thermodynamic processes of the atmosphere that govern the structure, development, and evolution of weather systems generally smaller than those of the synoptic scale.
Prerequisite: MAC 2312 and PHY 2048 and MET 4500C.

MET 4532 Hurricanes 3 Credits
Grading Scheme: Letter Grade
Meteorological and climatological concepts related to hurricanes. Forecasting current activity, researching past storms and analyzing storm structure, damage and future trends.
Prerequisite: MET 3503 or GEO 3250.

MET 4560 Atmospheric Teleconnections 3 Credits
Grading Scheme: Letter Grade
Atmospheric teleconnections are recurring large-scale patterns of pressure and circulation anomalies. They can influence temperature, rainfall, storm tracks and jet stream location and intensity. Examines how these patterns were discovered, how the index that characterizes the phase of each teleconnection is calculated and the weather associated with different phases.
Prerequisite: MET 3503 or GEO 3250 with a minimum B- grade.
Attributes: Artificial Intelligence

MET 4750 Spatial Analysis of Atmospheric Data using GIS 3 Credits
Grading Scheme: Letter Grade
How atmospheric data are collected and analyzed for meteorologic and climatologic-scale research. Where various types of data are obtained and how to analyze data to answer specific research questions.
Prerequisite: GEO 3250 or MET 3503 or MET 4532
Attributes: Artificial Intelligence

MET 4910 Honors Thesis 3 Credits
Grading Scheme: Letter Grade
Completion of an honors thesis that meets department specifications during the semester in which the student is enrolled.
Prerequisite: Senior standing and participation in department honors program.

MET 4911 Undergraduate Research in Meteorology and Climatology 0-3 Credits
Grading Scheme: Letter Grade
Provides firsthand, supervised research. Projects may involve inquiry, design, investigation, scholarship, discovery or application.

MET 4940 Meteorology Internship 1-3 Credits
Grading Scheme: S/U
Complete an internship with a meteorology organization or one that applies meteorology to a related field.
Prerequisite: Meteorology major with sophomore standing or higher.

MET 4950 Capstone in Meteorology 1 Credit
Grading Scheme: Letter Grade
Complete a team project addressing a common meteorological job task, which requires the integration of the core subfields of meteorology and their application to a sector of the weather enterprise. Create a resume, cover letter, and portfolio of completed work in preparation for the next career stage.
Prerequisite: Senior standing in Meteorology.