

# GEOGRAPHY AND SUSTAINABLE DEVELOPMENT (GEG)

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**GEG 101. Digital Earth. 3 Credit Hours.**

Explores various geospatial technologies and the societal implications of our digital world with particular emphasis locational services, mapping, imagery, and other capabilities.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 105. World Regional Geography. 3 Credit Hours.**

An introduction to geography's basic concepts within the framework of a comprehensive survey of the world's major regions.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 110. Introduction to Human Geography. 3 Credit Hours.**

An introduction to the sub-fields of human geography by an examination of patterns and process in the international system.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 120. Physical Geography. 3 Credit Hours.**

The Earth system (atmosphere; hydrosphere; biosphere; lithosphere) emphasizing the interrelationships among its constituent subsystems; human-environmental interactions and geographic dimensions of these four subsystems.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 198. Geographic Information System for Engineers. 1 Credit Hour.**

The fundamentals of Geographic Information Systems (GIS). A GIS is a set of hardware and software tools that allow people to work with data that are tied to a particular location. In this course students will learn how to import, analyze and display answers to spatial research questions using GIS software. By the end of the semester students should have a solid understanding of the various applications of Geographic Information Systems in numerous spheres of everyday life. No prior experience with GIS software is required for this course. This course is for College of Engineering students only.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 199. Geographic Information Systems for Engineers. 1 Credit Hour.**

The fundamentals of Geographic Information Systems (GIS). A GIS is a set of hardware and software tools that allow people to work with data that are tied to a particular location. In this course students will learn how to import, analyze and display answers to spatial research questions using GIS software. By the end of the semester students should have a solid understanding of the various applications of Geographic Information Systems in numerous spheres of everyday life. No prior experience with GIS software is required for this course.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 201. Topics in Geography. 1-3 Credit Hours.**

Select topics in Geography. Contents varies by semester and is indicated in parenthesis following course number and title in Class Schedule.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 203. Global Challenges. 3 Credit Hours.**

Analyzes 21st-century global challenges related to population growth, climate change, and sustainable development. Applies innovative solutions to contemporary challenges such as the sustainability of food, water, energy, healthcare, and security systems (among others) in a world of 10 billion people.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 204. Global Economics. 3 Credit Hours.**

Global economics is the study of the world's economic system and its interactions with international and domestic policies. This course presents core materials essential to understanding more advanced economic studies. In this class, we will explore the financial, historical, cultural, and environmental forces of economics and policies from a global perspective. In the first part of the course, we will begin with an introduction to basic economic principles and theories relevant at the global level. We will then delve into the nuances of the global economy through discussions of concepts such as international trade institutions, tariffs, exchange rates, and monetary policies. In the second part of the course, we will apply these ideas to understand how different types of global goods are allocated, shared, and consumed. In the third part of the course, we will learn about some frontier research on different topics related to globalization.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 231. Environmental Geography. 3 Credit Hours.**

Designed to encourage students to think deeply, critically, and coherently about the interaction between human societies and nature from a geographical perspective. Explores the societal dependence on natural ecosystems. Assess the magnitude and impacts of the environmental changes caused by human activities in the biosphere and evaluates the hypothesis that the earth has moved into in a new geologic epoch. Explores the concept of sustainable development and how countries are implementing it.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 235. Wine, Environment & Society. 3 Credit Hours.**

Explores regional differences in wine production, consumption, economics, culture, politics, and globalization, while cultivating basic wine literacy.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 241. Health and Medical Geography. 3 Credit Hours.**

Integrates public health and medicine with human and environmental geography using three approaches: ecological (the interaction of disease and our natural/built environments), social (the behavioral effects of culture, poverty, and politics), and spatial (using geospatial technology to better understand and improve health services and outcomes).

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 260. Miami's Climate Challenge: Past, Present, and Future. 3 Credit Hours.**

This interdisciplinary course aims to provide students with an informed understanding of Miami, explicitly concerning how its past, present, and future influence its climate vulnerabilities and how recent advances can be leveraged to develop current and next-generation resilience and adaptation strategies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 266. Metropolitan Miami. 3 Credit Hours.**

This course provides interdisciplinary perspectives on the urbanization of South Florida and on Miami's urban milieu. The course uses the case of Metropolitan Miami to introduce and illustrate a range of basic concepts in urban studies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 281. Economic Geography. 3 Credit Hours.**

Explores processes driving spatial patterns of economic activity at the global, national, regional, and local scales. Topic areas include economic globalization, spatial distribution of industrial sectors, multinational corporations, international trade, regional economic development, and illegal economic activities. Examines the development of the global marketplace in both the developed and the developing world.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 305. Spatial Data Analysis I. 3 Credit Hours.**

The use of basic methods or quantitative analysis for spatial data, including basic descriptive and inferential statistics and special techniques for spatial data.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 306. Geographic Research Methods. 3 Credit Hours.**

The fundamentals of social science research, such as research design, hypothesis formulation, and field data collection, with particular emphasis on quantitative and qualitative geographic analytical methods.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 310. Geographic Information Systems I. 3 Credit Hours.**

The fundamentals of Geographic Information Systems (GIS). GIS is a set of hardware and software tools that allow people to work with data that are tied to a particular location. In this course students will learn how to import, analyze and display answers to spatial research questions using GIS software. By the end of the semester students should have a solid understanding of the various applications of Geographic Information Systems in numerous spheres of everyday life. No prior experience with GIS software is required for this course.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 312. People, Plagues & Pandemics. 3 Credit Hours.**

An introductory overview to emerging infectious diseases (EIDs) in the context of previous global outbreaks, focusing on geography, origin, and management response. Through a combination of discussions and/or group activities, case studies, and lecture style introductions to weekly themes, students will gain a deeper understanding of disease, or group of diseases as illustrations of the impact of global outbreaks, responses, social, demographic, economic, and environmental context of historical and modern epidemics; and on basic models of infectious disease processes.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 315. Digital Cartography. 3 Credit Hours.**

An introduction to cartographic methods, interpretation and history. Students learn basic principles of visual representation, how to map qualitative and quantitative data, and how to prepare maps for publication and the web.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 321. Remote Sensing of the Environment. 3 Credit Hours.**

Theory and techniques of environmental remote sensing and imagery interpretation for earth resources monitoring and management.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 331. Sustainable Development. 3 Credit Hours.**

The concepts of sustainable development, its origins, and the global conventions associated with it. We use indicators of human well-being, governance, environmental conservation, social inclusion, and economic prosperity to evaluate how countries are making their development trajectories more sustainable. Although most of our discussion adopts a global perspective, the research conducted by students is focused on the challenges for implementing sustainable development policies in tropical and sub-tropical countries.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 332. Climatology and Extreme Weather. 3 Credit Hours.**

Covers introductory information about Earth's atmosphere, weather development, and extreme weather events. Introduces basic concepts of the science of weather and climate, and current scientific developments in areas such as extreme weather forecasting and global climate change.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 334. Biogeography and Conservation. 3 Credit Hours.**

Explores the modern science of biogeography and its implications for the design of spatial strategies to conserve biodiversity and ecosystem services. Examines the history of biogeography and its geographical and ecological foundations. Discusses the fundamental biogeographical processes and uses them to investigate the evolution of biotas and explain the current biogeographic patterns. Explores the emerging field of conservation biogeography and its applications.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 335. Sustainable Food Systems. 3 Credit Hours.**

A sustainable food system sustains environmental health and local economies, and is socially just. We will explore the intricacies of global geographies of major food systems and how these systems have come to be. We will identify where major food types are produced, why and where the major demand centers are. Further, we will seek answers to fundamental food-related questions, including: in an age of plenty, why do people still starve, and what can be done about it? How do we explain malnutrition in some parts of the world and obesity in others? Can there really be such a thing as a "sustainable global food systems?" Finally, we will examine what the future implication for food is through exploratio1 and evaluation of a range of visions for a safe, sustainable food system.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall Even Years.

**GEG 336. Hazards and Disasters: The Nature-Society Interface. 3 Credit Hours.**

Explores how human-environment interactions determine the distribution, causes and consequences of natural hazards and disasters.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 337. Climate Change, Sea Level Rise and Society. 3 Credit Hours.**

This course provides an understanding of the scientific evidence for the reality and imminent seriousness of climate change, an assessment of the societal and environmental repercussions, and preparation to communicate, prepare for, and begin trying to solve this most serious problem of our century.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 338. Landscape Character, Dynamics, Evolution; Influence on Societal Habitation and Risks. 3 Credit Hours.**

A thorough look at the nature of how Earth's landscape character, dynamics, and evolution defines the nature of human societies and their habitation potential and risks, both now and with increased population growth and global warming.

Requisite: One introductory course from GEG or GSC or ECS.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 341. Population, Health, and Environment. 3 Credit Hours.**

Global human population dynamics and implications for environmental sustainability; topics include population growth and structure, mortality and fertility patterns, migration, urbanization, aging, and household composition.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 343. Population, Sustainability, and the Media. 3 Credit Hours.**

Explores opposing views of population growth and environmental sustainability through the media and cinema: contrasts "Doomsters" who believe population growth and resource consumption threaten human survival and pro-growth "Boomsters" who believe human ingenuity and technology will continue to allow humankind to prosper.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 345. Global Water Security & Sustainability. 3 Credit Hours.**

Explores the physical, social, economic, and political dimensions of global water insecurity, particularly the management of global drinking water supplies, through an interdisciplinary social science lens that recognizes water's importance to social equity and environmental sustainability.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 346. Immigrant and Refugee Health. 3 Credit Hours.**

A theoretical background essential for understanding the complex interaction of migration and health. Students will gain a basic understanding of the theories surrounding the movement of people within and across political boundaries. Emphasis will be placed on the health issues experienced by displaced populations including refugees, migrants, and internally displaced persons. We will explore some of the difficulties that receiving communities face in addressing the health needs of migrants, the roles of actors involved in working with displaced populations and how emigration of a large segment of the population, either abruptly or over time, affects sending communities as well. Much of the class will consist of guest speakers and case studies presented by different healthcare professionals working with migrant communities, with examples of the problems faced and solutions achieved in addressing issues of immigrant and refugee health drawn for both national and international experience.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 348. Climate Change and Public Health. 3 Credit Hours.**

The mechanisms by which climate change adversely affects human health, and the policy options for mitigating our exposure.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 351. Geopolitics and Peacebuilding. 3 Credit Hours.**

Explores the political and legal responses, both national and international, to violations of Human Rights associated with conflicts and totalitarian regimes around the world, with emphasis on the peace building process in diverse geographical locations.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 352. Crime and the City. 3 Credit Hours.**

Explores why there is so much violent crime in certain cities of the Americas and why there are such marked spatial differences between, and within, these cities. Contrasts and discusses specific issues (and myths) of crime, punishment, and policing in the Americas using a variety of academic and institutional research on violent crime.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 353. United States National Security. 3 Credit Hours.**

Examines a broad spectrum of such challenges to US national security, simulating the role of policy makers and strategists for the Office of the President.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 354. Global Human Rights. 3 Credit Hours.**

Equips students with a broad perspective to think critically about the global issues surrounding the foundations of Human Rights together with questions about its universality, reach, and enforceability.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 355. Global Political Economy. 3 Credit Hours.**

Explores the relationship between the global economy and politics, as governments seek both to shape it and to respond effectively to the constraints and opportunities it provides.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 356. Latin American Political Economy. 3 Credit Hours.**

Examines Latin America's economic development, analyzing different developmental strategies, resource endowment, institutional framework, and other related variables.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 357. Economics of Sustainable Development. 3 Credit Hours.**

Economics of sustainable development studies the economic aspects of how society sustainably manages natural resources and the environment while improving human well-being. The first half of the class will begin with sustainable development principles and practices in various settings, focusing on institutions, governance, and economic policies. Critical issues cover sustainable development of land and water, risk and economic security, and disaster management. The second half of the class will discuss the evolution of smart growth in urban planning globally over the past three decades, mapping the trajectory from its original principles to its position as an important paradigm in sustainable urban planning today. Specifically, we will learn about the economic aspects of smart growth, how these aspects have been embedded in government policies for sustainable development, and to what extent these policies have achieved their goals. Throughout the course, we will work on various case studies focusing on recent topics worldwide.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 359. Resilience Economics. 3 Credit Hours.**

Resilience economics studies the economic aspects of how society adapts to climate change and natural disasters. The first half of the course will explore the economic tools and methods we use to analyze climate adaptation. Essential elements we will cover include discounting, risk and uncertainty, distributional impacts, monetary and non-monetary evaluations, and the cost-benefit analysis. The second half of the course will explore how the interactions between humans and the environment determine the causes, consequences, and distribution of climate change and natural disasters. Particularly, we will discuss the difficulties society faces relating to adaptative strategies from the economic perspective. Critical issues we will cover include agriculture, energy, health, and extreme events. Throughout the course, we will work on various case studies based on recent events worldwide.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 361. Urban Sustainability in Asia. 3 Credit Hours.**

The emerging field of urban sustainability from an interdisciplinary perspective by providing major theories, methodologies, and practices in sustainable urbanism. Specific attention is paid to urban resilience, economic inequality, urban ecology, and environmental injustice in Asian cities.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 362. World Urban Geography. 3 Credit Hours.**

An introduction to the principles and methods that apply to the geographic study of cities and urbanization.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 365. Land Use Planning. 3 Credit Hours.**

Sustainable management of cities requires careful and intelligent use of land, a scarce and finite resource. Land use planning exercised by state, regional, and local governments determines where development occurs on the urban landscape. Such development should meet the needs of growing populations for housing, community services, and connectivity while ensuring environmental protection from the adverse impacts of development. This course provides an overview of land use planning concepts, frameworks, governance, physical design processes, and implementation tools for sustainable land use management. Three phases are introduced: land use concepts, land use analysis, and land use planning.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 366. Cities in Time and Space. 3 Credit Hours.**

Interdisciplinary perspectives on the city, urbanity, and urbanization through a series of wide-ranging historical-geographical contexts. Field excursions are incorporated into the course.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 375. Waste Sustainability. 3 Credit Hours.**

This course explores how society can reduce harmful waste products and become more sustainable. Students will assess contemporary global approaches to waste reduction and the role of technology and policy in achieving circular economies by tracing major industrial and consumer waste streams (e.g., paper, plastic, glass, metal, e-waste) using an interdisciplinary lens.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Spring & Summer.

**GEG 381. Geography and Development in Africa. 3 Credit Hours.**

A survey of the geography of Africa south of the Sahara, with particular emphasis on development and the role of African states in the international system.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 382. Political Geography of the Middle East. 3 Credit Hours.**

Geography of the Middle East with emphasis on current political topics.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 383. Geography and Development in South America. 3 Credit Hours.**

An introduction to the geography of South America. Explores the interface between societies and nature in this diverse and complex world region. Covers the major challenges that the countries of the continent are facing to improve their socio-economic indicators as well as protect their unique natural ecosystems.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 384. Geography of South Florida. 3 Credit Hours.**

Human and physical geography of South Florida.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 385. Jewish Geography. 3 Credit Hours.**

Facts of Jewish history, geography, and demography both in the world and the United States. Basic geographic concepts that help us to understand the Jewish world and provide a basis for understanding the various ways that Jewish communities have adapted to different geographic circumstances.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 386. China in the 21st Century. 3 Credit Hours.**

The specifics of the newly-emerging economic and political giant of Asia-China, with an explicit emphasis on the patterns and characteristics of economic transition and reform, as well as how reform has reshaped China's geo-economic landscape, natural environment, and the international political and economic order.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 390. Topics in Geography. 3 Credit Hours.**

Content and prerequisites announced when offered. Course may be repeated for credit if content varies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 398. Independent Research. 0-6 Credit Hours.**

Independent research conducted one on one with a faculty member.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 399. Independent Study. 0-6 Credit Hours.**

Independent study.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 402. Geographic Thought and Analysis. 3 Credit Hours.**

An introduction to the history of geographic thought and geographic analysis, and to some important sub-disciplines of Geography. At the end of the semester, students will have a better understanding of the history of Geography, of its place in the academy, and important theoretical and methodological debates and themes within the discipline. Our purpose in this seminar is to create a dynamic and focused intellectual environment in which learning is a collective process. To achieve that we will analyze, critique, question and debate the weekly readings. There will be little formal lecturing on my part. Instead, class time will be spent in open discussion and hands-on projects completed individually or in teams. Throughout the semester, we will also host guest speakers, who will give you insights into their scholarship and give you further exposure to the discipline of Geography. Be ready to read and write a lot, and come to class prepared to discuss!

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 405. Spatial Data Analysis II. 3 Credit Hours.**

Social and environmental science applications of spatial statistical analysis illustrated with data and numerical (simulation experiments) examples employing interactive software. This course's focus is on spatial autocorrelation.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring Odd Years.

**GEG 406. Survey Research Methods. 3 Credit Hours.**

The use of survey research including the choice of a survey mechanism, sampling, questionnaire design, survey logistics, survey analysis, and reporting of results.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 410. Geographic Information Systems II. 3 Credit Hours.**

An introduction to spatial analysis, which consists of techniques for analyzing patterns of and interrelationships between spatial data. Topics include vector polygon editing and topology, integration of raster and vector data, surface analysis and 3D analysis, suitability mapping, spatial modeling, and multi-criteria evaluations.

Prerequisite: GEG 310.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 412. GIS for Health and Environment. 3 Credit Hours.**

This course provides practical experience in using spatial technologies to address issues of health and environment. This course will provide an introductory level approach to using the ArcGIS software, so even if you have never used it, you can learn what you need. Lectures, discussions, readings and guest speakers will provide content and background. A final project will allow you to explore your own interests.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring Odd Years.

**GEG 414. Crime Mapping and Analysis. 3 Credit Hours.**

Provides a basic understanding of the spatial analysis of issues related to criminal justice and crime mapping using state-of-the-art GIS software.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring Even Years.

**GEG 415. Web GIS. 3 Credit Hours.**

This course introduces students to the fundamentals of Web GIS. The lectures will focus on the theories and principles behind Web GIS, and the tutorials and lab exercises will focus on its practical applications. Students will learn how to create and customize web-based mapping applications mainly using ArcGIS Online, a cloud-based mapping and analysis software from ESRI. Lab exercises will be oriented to the creation of interactive maps, webapps, story maps, dashboards, and other types of apps that can be shared with users from the University of Miami or from around the world. Students will also learn how to design surveys and how to collect data in the field using mobile GIS, and how to apply Web GIS to solve other problems.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 416. Urban Analytics and Geovisualization. 3 Credit Hours.**

Cities produce vast amounts of data due to growing digitization in society and the built environment. This course demonstrates how urban data can be collected from diverse sources, analyzed, and communicated through computation and visualization tools. You will be exposed to cutting-edge datasets typically encountered by professional analysts and gain hands-on experience exploring complex data using web-based mapping, dashboard design, and story mapping techniques. We will use multiple software platforms, including Tableau, CartoDB, ArcGIS, Datawrapper, and Flourish through a series of mini-projects, individually and in small groups. We will further explore applications of these tools through our guest speakers from local governments who will demonstrate how data and analytics are being used to advance more sustainable and smarter cities. The course will prepare you to communicate data with confidence and engage the broader public with your insights. You will not only design visualization but also learn to evaluate what makes users more engaged while using visual interfaces. The course will encourage students to engage with ethical considerations associated with data production, usage, and governance. Overall, you will gain a critical appreciation of the potential for urban analytics and geovisualizations to inform community solutions and policymaking.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 421. GIS and Environmental Modeling. 3 Credit Hours.**

Space-time modeling in a GIS environment with emphasis on raster-based models of land cover change, urban expansion, species distribution, wildfire propagation, and other environmental issues.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 432. Climate Change and Security. 3 Credit Hours.**

There is an emerging global consensus that climate change will stress the economic, social, and political systems that underpin each nation state. Where institutions and governments are unable to manage the stress or absorb the shocks of a changing climate, the risks to the stability of states and societies will increase.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 444. Energy Security & Environmental Sustainability. 3 Credit Hours.**

This course will introduce students to the concepts of energy security and environmental sustainability. It will stress the importance of energy and mitigation of climate change in the formulation of country strategies, advancement of national interests, and shaping of the international system.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Summer.

**GEG 445. Human Security: Prevention and Mitigation. 3 Credit Hours.**

This course will explore theoretical approaches and the major global threats to human security along some of the most promising policy solutions. After introductory sessions on traditional and critical concepts of security, state-centric and human-centric concepts of security the course will focus on key human security topics including human trafficking, climate change, artificial intelligence and global inequality.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring & Summer.

**GEG 490. Topics in Geography. 0-3 Credit Hours.**

Select topics in Geography. Contents varies by semester and is indicated in parenthesis following course number and title in Class Schedule.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 501. Capstone Research Seminar. 3 Credit Hours.**

Project-based fundamentals of social science research; emphasizes research conceptualization and design, application of methods, data management, scientific writing, multi-modal presentation of findings, and professional development skills.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 505. Seminar in Methods of Analysis. 3 Credit Hours.**

The use of advanced quantitative, qualitative, and mixed methods in the solution of geographic research problems.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 507. Seminar in Field Methods. 3 Credit Hours.**

With a focus on geospatial applications, this methods course introduces students to field research addressing complex socio-environmental issues. The course includes exercises with GPS data collection; geo-tagged photography; ground truthing; spatial survey design; and distributed GIS. Various research areas and cognate field methods including environmental demography, community surveying, cultural mapping, and multi-sited ethnography.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 519. Immigration to the United States. 3 Credit Hours.**

A description and analysis of current immigration patterns in the United States.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 520. Sustainable Cities. 3 Credit Hours.**

The emerging field of urban sustainability from an interdisciplinary perspective, by providing major theories and methodologies in sustainable urbanism, especially in terms of urban resilience, economic inequality, urban ecology, and environmental justice.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 530. Conservation and Development. 3 Credit Hours.**

Explore the synergies and trade-offs between biodiversity conservation and human development. Uses the concept of green infrastructure to demonstrate as biodiversity conservation is an essential component of human development. Discusses the global conventions that seek to protect biodiversity conservation and how they have been implemented worldwide. Evaluate the roles played by governments, NGOs, local communities, corporations, and multilateral agencies to protect biodiversity. Map current global efforts to protect global ecosystems and identify the major bottlenecks. This is a research-based course in which students learn how to collect and analyze conservation and development data as well as improve their presentation and writing skills.

**Components:** RSC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 532. Conservation Biogeography. 3 Credit Hours.**

Explore/ the emerging discipline of Conservation Biogeography, that is the application of biogeographical principles, theories, and analyses to problems concerning the conservation of biodiversity. Discusses major global biogeographical patterns and processes; biodiversity patterns in terrestrial, freshwater and marine ecosystems; social values and conservation; protected area policy and financing; systematic conservation planning; and protected area design and management. This is a very intense research-based course in which students learn how to collect and analyze biogeographical data as well as improve their presentation and writing skills.

**Components:** RSC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 561. Seminar in International Development. 3 Credit Hours.**

Topics in the study of development. Content and prerequisites vary.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 562. Seminar in Urban Management. 3 Credit Hours.**

Select topics in urban management. Contents varies by semester and is indicated in parenthesis following course number and title in Class Schedule.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 563. Seminar in Urban Geography. 3 Credit Hours.**

Topics in the study of urban geography. Content and prerequisites vary.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 580. Introductory Quantitative Methods for Geographical Analysis.. 3 Credit Hours.**

Basic quantitative methods for geographic analysis.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 590. Advanced Topics in Geography. 1-6 Credit Hours.**

Content and prerequisites vary by semester.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 597. Internship in Geography. 0-6 Credit Hours.**

Students are assigned to work for a local public or private agency.

**Components:** FLD.

**Grading:** SUS.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 598. Advanced Independent Research. 0-6 Credit Hours.**

Independent research conducted one on one with a faculty member.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 599. Advanced Independent Study. 0-6 Credit Hours.**

Independent study.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 602. Geographic Thought and Analysis. 3 Credit Hours.**

Seminar for Graduate and senior undergraduate students about geographic thought and geographical traditions.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 603. Research Design in Geography. 3 Credit Hours.**

Designing and proposing geographic research projects based upon a critical reading of the geographical literature. Students will prepare a master's thesis (master's students) or dissertation (doctoral students) project proposal.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 610. Survey Research Methods. 3 Credit Hours.**

The use of survey research including the choice of a survey mechanism, sampling, questionnaire design, survey logistics, survey analysis, and reporting of results.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 612. Health Applications of Geographic Information Systems. 3 Credit Hours.**

Ideas from a broad range of geospatial health subjects, and hands-on exercises to help students to better process spatial data and use them for specific analyses that address issues related to health.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Spring Odd Years.

**GEG 613. Advanced Cartography. 3 Credit Hours.**

Cartographic research techniques, cognitive mapping, distortion, transformations and cartograms. Prerequisite: GEG 280 or equivalent.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 616. Urban Analytics & Geovisualization. 3 Credit Hours.**

Cities produce vast amounts of data due to growing digitization in society and the built environment. This course demonstrates how urban data can be collected from diverse sources, analyzed, and communicated through computation and visualization tools. You will be exposed to cutting-edge datasets typically encountered by professional analysts and gain hands-on experience exploring complex data using web-based mapping, dashboard design, and story mapping techniques. We will use multiple software platforms, including Tableau, CartoDB, ArcGIS, Datawrapper, and Flourish through a series of mini-projects, individually and in small groups. We will further explore applications of these tools through our guest speakers from local governments who will demonstrate how data and analytics are being used to advance more sustainable and smarter cities. The course will prepare you to communicate data with confidence and engage the broader public with your insights. You will not only design visualization but also learn to evaluate what makes users more engaged while using visual interfaces. The course will encourage students to engage with ethical considerations associated with data production, usage, and governance. Overall, you will gain a critical appreciation of the potential for urban analytics and geovisualizations to inform community solutions and policymaking.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 619. Immigration to the United States. 3 Credit Hours.**

A description and analysis of current immigration patterns in the United States.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 620. Sustainable Cities. 3 Credit Hours.**

The emerging field of urban sustainability from an interdisciplinary perspective, by providing major theories and methodologies in sustainable urbanism, especially in terms of urban resilience, economic inequality, urban ecology, and environmental justice.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 622. Urbanization in the Developing World. 3 Credit Hours.**

Patterns and processes in large cities in the developing world are examined.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 623. Seminar in Urban Management. 3 Credit Hours.**

Identification of and responses to urban problems in large cities in European and Latin American metropolitan areas. Emphasis is on demographic, cultural/ethnic, service-provision, environmental, transportation, and land-use problems. Approach is via case studies, theory applications, and planning practicalities.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 625. Advanced Independent Study in Geography I. 1-6 Credit Hours.**

Advanced independent study for Two-Paper Option for first paper.

**Components:** THI.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 630. Practicum in Sustainability. 1-9 Credit Hours.**

A practicum offering a concentration in experiential learning. It serves students specializing in the Sustainability track in the MPS in Urban Sustainability and Resilience Program by engaging them in a real-world project experience. The course consists of working with non-profits and/or government organizations identified by UM faculty experts. Students will be advised by the course facilitator but will work directly with the client organization. There will be some assigned reading/lecture content and invited speakers. The speaker topics covered will include project management, critical reflections, and team collaboration. The goal is to provide a hands-on learning experience and immersion in a professional working environment that pertains to sustainability.

**Components:** PRA.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 632. Seminar in Environmental Geography and Planetary Health. 3 Credit Hours.**

Advanced topics in Environmental Geography from a systems approach.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 635. Internship in Geography. 1-9 Credit Hours.**

Students are assigned to work for a local public or private agency.

**Components:** THI.

**Grading:** SUS.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 636. Sustainable Food Systems. 3 Credit Hours.**

The intricacies of global geographies of major food systems, how these systems have come to be and where major food types produced, why and where the major demand centers are. It also examines what the future implication for food is through exploration and evaluation of a range of visions for a safe, sustainable food system.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall Even Years.

**GEG 637. Development Studies. 3 Credit Hours.**

Advanced seminar on issues in contemporary development studies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 643. Population, Sustainability and the Media. 3 Credit Hours.**

Explores opposing views of population growth and environmental sustainability through the media and cinema: contrasts "Doomsters" who believe population growth and resource consumption threaten human survival, and pro-growth "Boomsters" who believe human ingenuity and technology will continue to allow humankind to prosper.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 645. Advanced Independent Study in Geography II. 1-6 Credit Hours.**

Advanced independent study for Two-Paper Option for second paper.

**Components:** THI.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 646. Immigrant & Refugee Health. 3 Credit Hours.**

A theoretical background essential for understanding the complex interaction of migration and health. Emphasis is placed on the health issues experienced by displaced populations including refugees, migrants, and internally displaced persons.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 648. Climate Change and Public Health. 3 Credit Hours.**

The mechanisms by which climate change adversely affects human health and the policy options for mitigating our exposure.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 652. Seminar on the Geography of South Florida. 3 Credit Hours.**

Human and physical geography of South Florida.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 655. Field Methods and Geospatial Analysis. 3 Credit Hours.**

With a focus on geospatial applications, this methods course introduces students to field research addressing complex socio-environmental issues. The course includes exercises with GPS data collection; geo-tagged photography; ground truthing; spatial survey design; and distributed GIS. Various research areas and cognate field methods including environmental demography, community surveying, cultural mapping, and multi-sited ethnography.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 656. Interdisciplinary Issues in Latin American and Caribbean Studies. 3 Credit Hours.**

Political, economic, social, and cultural issues of Latin American and Caribbean area Studies.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 657. Economics of Sustainable Development. 3 Credit Hours.**

Economics of sustainable development studies the economic aspects of how society sustainably manages natural resources and the environment while improving human well-being. The first half of the class will begin with sustainable development principles and practices in various settings, focusing on institutions, governance, and economic policies. Critical issues cover sustainable development of land and water, risk and economic security, and disaster management. The second half of the class will discuss the evolution of smart growth in urban planning globally over the past three decades, mapping the trajectory from its original principles to its position as an important paradigm in sustainable urban planning today. Specifically, we will learn about the economic aspects of smart growth, how these aspects have been embedded in government policies for sustainable development, and to what extent these policies have achieved their goals. Throughout the course, we will work on various case studies focusing on recent topics worldwide.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 658. Seminar in Comparative Politics I. 3 Credit Hours.**

Comparative political analysis within and across nations. Debates on state formation, democracy and development, democratization, and the role of ideas, interests, and institutions.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 659. Resilience Economics. 3 Credit Hours.**

Resilience economics studies the economic aspects of how society adapts to climate change and natural disasters. The first half of the course will explore the economic tools and methods we use to analyze climate adaptation. Essential elements we will cover include discounting, risk and uncertainty, distributional impacts, monetary and non-monetary evaluations, and the cost-benefit analysis. The second half of the course will explore how the interactions between humans and the environment determine the causes, consequences, and distribution of climate change and natural disasters. Particularly, we will discuss the difficulties society faces relating to adaptative strategies from the economic perspective. Critical issues we will cover include agriculture, energy, health, and extreme events. Throughout the course, we will work on various case studies based on recent events worldwide.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring.

**GEG 661. Urban Geography I. 3 Credit Hours.**

An introduction to the essential elements about the growth and development of cities. Review of the challenges of urbanization and urban sustainability in the contemporary period.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 663. Urban Geography II. 3 Credit Hours.**

Analysis of the spatial structure of urban centers, the development of and interaction between functional zones, and the movement of goods and people in urban areas.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 665. Land Use Planning. 3 Credit Hours.**

Sustainable management of cities requires careful and intelligent use of land, a scarce and finite resource. Land use planning exercised by state, regional, and local governments determines where development occurs on the urban landscape. Such development should meet the needs of growing populations for housing, community services, and connectivity while ensuring environmental protection from the adverse impacts of development. This course provides an overview of land use planning concepts, frameworks, governance, physical design processes, and implementation tools for sustainable land use management. Three phases are introduced: land use concepts, land use analysis, and land use planning.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 675. Waste Sustainability. 3 Credit Hours.**

This course explores how society can reduce harmful waste products and become more sustainable. Students will assess contemporary global approaches to waste reduction and the role of technology and policy in achieving circular economies by tracing major industrial and consumer waste streams (e.g., paper, plastic, glass, metal, ewaste) using an interdisciplinary lens.

**Components:** SEM.

**Grading:** GRD.

**Typically Offered:** Spring & Summer.

**GEG 680. Spatial Data Analysis I. 3 Credit Hours.**

The use of basic methods or quantitative analysis for spatial data, including basic descriptive and inferential statistics and special techniques for spatial data.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 681. Spatial Data Analysis II. 3 Credit Hours.**

Social and environmental science applications of spatial statistical analysis illustrated with data and numerical (simulation experiments) examples employing interactive software. This course's focus is on spatial auto correlation.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Spring Odd Years.

**GEG 685. Digital Cartography. 3 Credit Hours.**

Introduction to cartographic methods, interpretation, and history. Basic principles of visual representation, how to map qualitative and quantitative data, and how to prepare maps for publication and the web.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 691. Geographic Information Systems I. 3 Credit Hours.**

An introduction to fundamental concepts in Geographic Information Systems (GIS) and related geographic technologies. Students are exposed to leading GIS software tools used in the industry.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 692. Remote Sensing of the Environment. 3 Credit Hours.**

Theory and techniques of environmental remote sensing and imagery interpretation for earth resources monitoring and management.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall.

**GEG 693. Geographic Information Systems II. 3 Credit Hours.**

An introduction to spatial analysis, which consists of techniques for analyzing patterns of and interrelationships between spatial data. Topics include vector polygon editing and topology, integration of raster and vector data, surface analysis and 3D analysis, suitability mapping, spatial modeling and multi-criteria evaluations.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall & Spring.

**GEG 695. Web GIS. 3 Credit Hours.**

Map serving technologies and internet map design, focusing on the programming concepts needed to construct and implement high-quality web mapping applications.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Offered by Announcement Only.

**GEG 758. Seminar in Comparative Politics II. 3 Credit Hours.**

Theoretical approaches and methodological debates in Comparative Politics.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 810. Master's Thesis. 1-6 Credit Hours.**

The student working on his/her master's thesis enrolls for credit, in most departments not to exceed six, as determined by his/her advisor. Credit is not awarded until the thesis has been accepted.

**Components:** THI.

**Grading:** SUS.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 820. Research in Residence. 1 Credit Hour.**

Used to establish research in residence for the thesis for the master's degree after the student has enrolled for the permissible cumulative total in GEG 710 (usually six credits). Credit not granted. May be regarded as full time residence.

**Components:** THI.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.

**GEG 825. Continuous Registration--Master's Study. 0 Credit Hours.**

To establish residence for non-thesis master's students who are preparing for major examinations. Credit not granted. Regarded as full time residence.

**Components:** LEC.

**Grading:** GRD.

**Typically Offered:** Fall, Spring, & Summer.