

WELCOME PROSPECTIVE, CURRENT, AND GRADUATING **EEGS** STUDENTS

DEPARTMENT MISSION

We prepare students for their future careers by cultivating critical thinking and science-based inquiry skills. Students develop foundations in earth, environmental, and geographical sciences to analyze local and global issues challenging thehuman-environment relationship. EEGS faculty members engage in active research, professional development, and service to enhance quality teaching and provide an interdisciplinary curriculum.

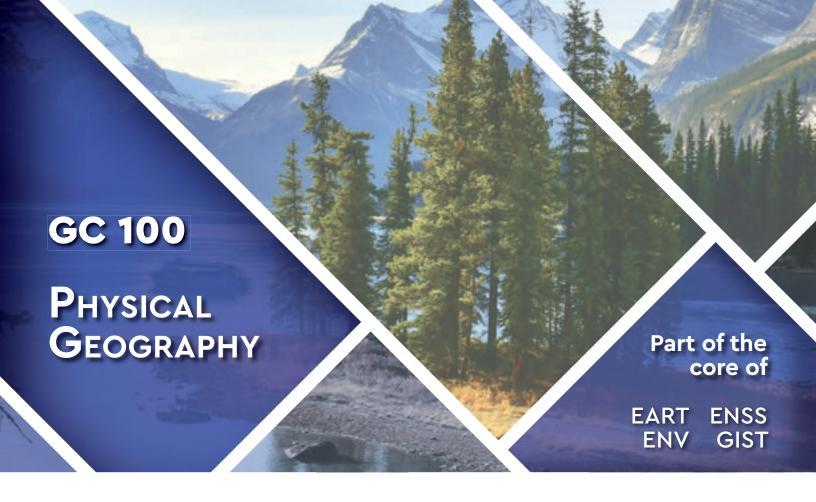












This course examines interactions between the atmosphere, the Earth's surface, water, and living things, as well as the role of humans in those interactions. Students will be able to explain the processes that drive Earth's seasons, weather, climates, biomes, and landforms, and how they are impacted by human activities. Students will learn how to develop research questions, collect data, and produce and interpret graphs, maps, and figures relating to major geographic patterns and their processes.

Offered: Fall; Winter; Summer

Satisfies: Scientific Inquiry (SCII) General

Education requirement.















This course introduces students to Environmental Science and its role in ensuring a sustainable future. Students will discuss and synthesize complex environmental issues while drawing from their own experiences and other disciplines. Students also examine the science behind those issues involving both social and ecological systems. Course assignments strive to show students how to make decisions based upon their own assessment of scientific evidence.

Offered: Fall; Winter; Summer

Satisfies: Integrative Thinking (INTT) General

Education requirement.















Human Geography introduces students to the systematic study of locations, patterns, and processes that shape human understanding, use, and alteration of Earth's surface and their environments. Students will explore human activities around the world and in their own environments. They will explain how people affect places, how places affect people, and how geography impacts aspects of their daily lives. Students will also learn about the methods and tools geographers use in their research and practice.

Offered: Fall; Winter; Summer

Satisfies: Social Responsibility in a Diverse World (SOCR) and World Cultures (WC) General

Education requirements.















This course is designed to provide a comprehensive and applied understanding of soil physical, biological, and chemical properties useful for environmental science, natural resource management, and agronomy related outcomes. This course will use a variety of professional measurement, assessment and analysis methods to examine soil biogeochemical processes that support conservation and management of soil resources.

Notes: Field work may be required. Contact instructor for more information.

Offered: Fall

Prerequisites: GC 100 or GC 101; or instructor's

permission .















This course is designed to provide a basic introduction to the field of geography and related environmental fields. Students will learn the history of geography and its major theoretical paradigms and will engage in methodological approaches to study geographical phenomena. Students will build essential skill-sets including data collection methods, data analysis, research design, data visualization and scientific communication.

Notes: Field work may be required. Contact instructor

for more information.

Offered: Fall; Winter

Prerequisites: EN 211 and GC 164 or GC 100















Earth Hazards introduces students to the interdisciplinary study of extreme events that naturally occur and cause harm to humans. This includes volcanoes, earthquakes, landslides, wildfires, floods, cyclones, tsunamis, and meteorite impacts. Students will be able to explain how earth processes drive these hazards, the methods scientists use to predict and assess the risk of these events, and the means by which individuals and societies respond and adapt to them.

Offered: Contact department for information

Satisfies: Scientific Inquiry (SCII) General Education requirement.















Students examine global spatial variability of economic growth, economic development, standards of living and quality of life from a geographic perspective. Also examines the economic geography of the production of goods and services, and spatial patterns of consumption and environmental impact.

Offered: Fall; Winter















Students are introduced to major concepts and applications in the reading, analysis and interpretation of maps with special emphasis on USGS topographic maps. Lecture sessions cover major concepts and foundational knowledge, while lab sessions emphasize hands-on applications and commonly used techniques.

Notes: may require field work.

Offered: Fall; Winter

Satisfies: Scientific Inquiry (SCII) General

Education requirement.

Prerequisites: MA 100 or higher















This course introduces students to classic and spatial statistical concepts and techniques relevant to and used by environmental scientists, geographers, and geoscientists. Students will examine statistical concepts and methods and their theoretical underpinnings, and then apply their quantitative skills using computer-based tools and software. Students will assemble and analyze data sets and summarize their interpretations.

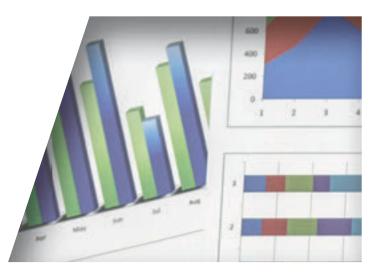
Offered: Fall; Winter; Summer

Satisfies: Scientific Inquiry (SCII) General

Education requirement.

Prerequisites: DATA 109, or MA 111, or

mathematics placement at MA 115 or higher.















Students examine the structures of the earth, tectonics, minerals, rocks, volcanoes, earthquakes, and the development of landforms.

Notes: Field work may be required. Contact instructor for more information.

Offered: Fall; Winter; Summer

Satisfies: Scientific Inquiry (SCII) General

Education requirement.















Sustainable development refers to the meeting the needs of the present without sacrificing future generations' ability to do so. Given global inequalities, sustainability means different things to different people. Case studies explored in this course will include those from the Global North and Global South, both rural and urban spaces. This course will also include field-based experiences and a community-based project allowing you to contemplate global sustainability while rooted in the environs around Marquette.

Offered: Fall; Winter

Prerequisites: EN 211, GC 164 and either GC 100,

GC 101 or GC 255.









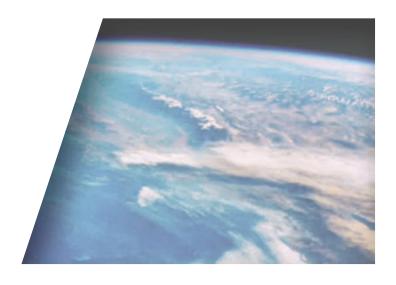






Examines the components of the climate system, the processes and feedbacks that influence climate, the techniques used to interpret past climates and predict future climate, and the patterns, variations, and events that have occurred, at different temporal and spatial scales. Also explores predictions for future climate change and some mitigation or adaptation strategies.

Offered: Every other Winter















Regional focus determined by demand and faculty availability.

Notes: May be repeated if topic differs.

Offered: Contact department for information.

Prerequisites: EN 211 and sophomore standing.















Urban Geography introduces students to concepts pertinent to the city, its origins, contemporary form, and urban challenges. Students will examine the city and urban phenomena in both the American context and international setting, and will be able to explain social, economic, demographic, and political forces that alter urban environments. Students will explore sustainability initiatives introduced by cities to address environmental challenges. Students will also apply methods and tools geographers use in research and practice.

Offered: Fall; Winter

Prerequisites: GC 164 or GC 220, and GC 205

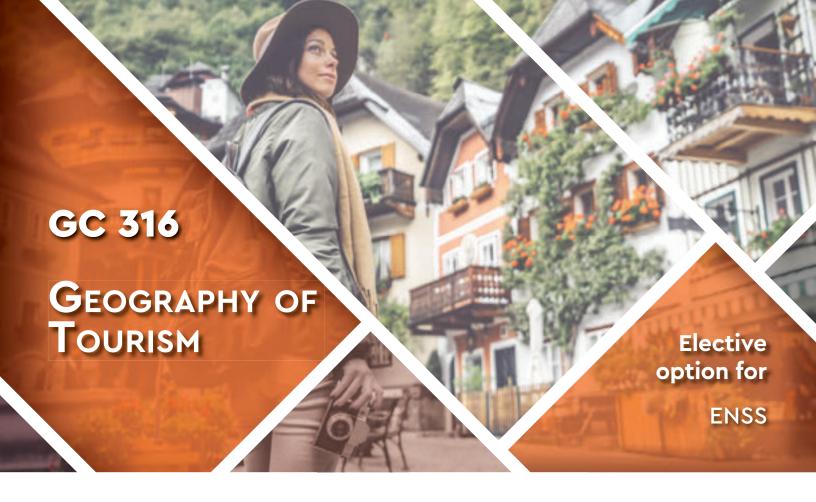












Understand the historical development of tourism, its importance to local and national economies and the impact that tourists have on the environment, economy and local cultures.

Notes: Field work may be required. Contact instructor for more information.

Offered: Contact department for information.

Prerequisites: GC 164 and GC 205, or instructor's

permission



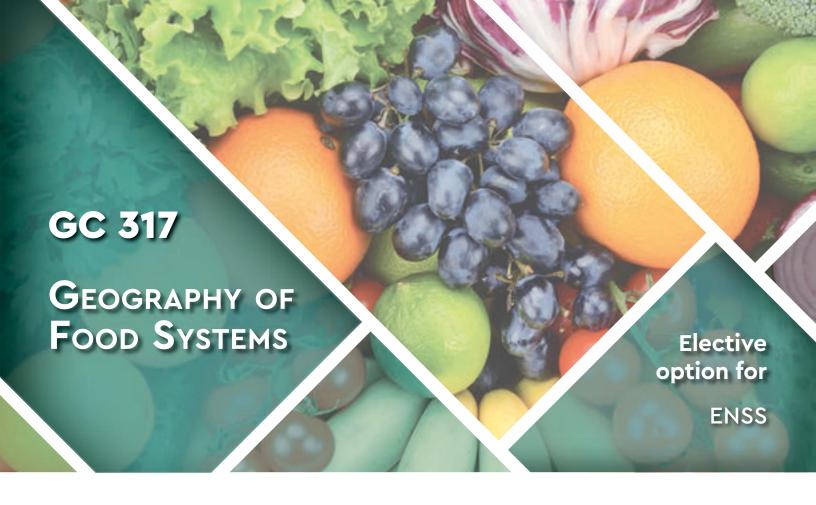












Students examines the different forces acting upon commodity flows from producer to consumer. Particular attention is given to the transition from agriculture to food manufacturing, globalization and food production and the environmental impact of food manufacturing.

Offered: Contact department for information.

Prerequisites: EN 211 or GC 205, or instructor permission.















Examination of the history and status of environmental laws in the United States at the national and state levels. Included is an introduction to the policy-making process in the U.S. as related to the human and natural environment.

Offered: Fall; Summer

Prerequisites: GC 100 or GC 101 or junior standing













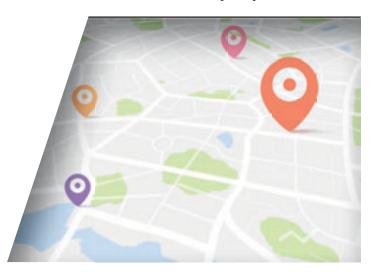


This course introduces students and professionals to foundational ideas underpinning the growing field of Geographic Information Systems (GIS). Students will examine fundamental concepts related to the creation, management, analysis, and visualization of geographic information. Students will then apply these concepts using industry-standard software to assemble and analyze data, and develop visualizations to communicate, solve problems, and make decisions. These skills will prepare students for work in a variety of job sectors.

Offered: Fall; Winter; Summer

Prerequisites: GC 225 or junior standing or

instructor permission











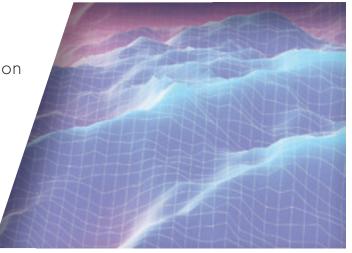




This course explores the art and science of representing a geographical area on a map. With GIS software, students analyze and visualize spatial data using traditional and cutting-edge techniques. Students apply principles of cartographic design to further their technical expertise in spatial science by creating web maps, thematic maps, cartographic figures for reports, and topographic maps using GIS data from various sources. Students develop portfolios of maps that are aesthetically appealing, practical, and effective.

Offered: Fall

Prerequisites: GC 335, or instructor's permission















An examination of our energy system, its development, and its future. Topics include: the foundational science concepts of energy and power; the use of energy in modern society; the technologies, resource availability, and environmental and social impacts of fossil fuels, nuclear energy, and renewable energy sources; the policy and economics surrounding energy use; and options for a sustainable energy system.

Offered: Contact department for information.

Prerequisites: Completion of MA 100 or above (or placement into DATA 109 or above)















Students examine strategies, methods, materials and media that can be used to improve the teaching-learning process of geography in grades seven through 12.

Offered: Fall

Prerequisites: GC 100, MA 111 or higher, or

instructor's permission















Population Geography enables students to explain issues and themes related to the patterns, processes, and consequences of the spatial distribution of people on Planet Earth. Students will analyze challenges associated with the geographic distribution of populations at the global, national, regional, and local scales, and they will learn the fundamental components of population change, fertility, mortality, and migration. Students will also apply methods and tools geographers use in their research and practice.

Offered: Winter

Prerequisites: EN 211 and sophomore standing.













Acquire practical knowledge of wetland ecosystems from around the world by examining their biogeochemical and societal properties. Wetlands is designed to provide students with professional skills and an applied understanding of wetland hydrology, soils, vegetation, management, restoration, and regulation.

Offered: Contact department for information.

Prerequisites: GC 100 or GC 101 or BI 210, and

GC 255















Examination of the techniques used by geologists in interpreting earth history. Particular attention is given to the physiographic provinces of the United States with emphasis on the Canadian Shield and interior plains and plateaus.

Notes: Field work may be required. Contact instructor for more information.

Offered: Contact department for information.

Prerequisites: GC 255















The study of earth surface processes and landforms. Surface features created by streams, glaciers, shorelines, groundwater and wind will be studied. Topographic maps, aerial photographs, the Atlas of Landforms and satellite imagery will be used in labs. Field trips are part of the course.

Offered: Contact department for information.

Prerequisites: GC 225; and GC 100 or GC 255 or

instructor's permission















Students will travel to many sites of geologic importance to collect samples and data, and interpret the geologic history through their observations. Techniques for collection and interpretation of geologic information, and the presentation of that information in the form of geologic maps and reports, are included earthquakes, and the development of landforms.

Offered: Contact department for information.

Prerequisites: GC 225 and GC 255.















Advanced examination of atmospheric processes including energy transfer and exchange, global atmospheric circulation, precipitation processes and forms, weather disturbances and upper-level processes. Also explores global climatic systems, climate change and paleoclimatology, and the impact of human activities on climate.

Offered: Fall

Prerequisites: GC 100, MA 111 or higher, or

instructor's permission



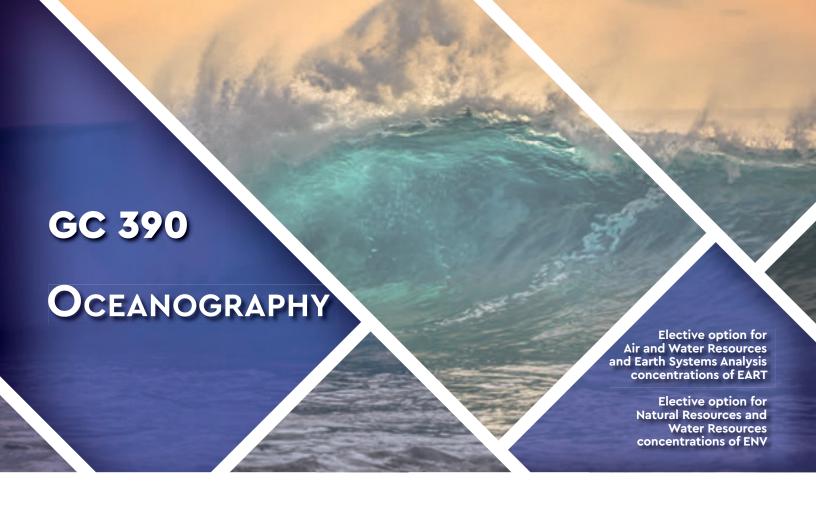












Examination of historical, chemical and physical, aspects of the world's oceans and seas. The course also deals with the interaction of water bodies with the atmosphere, solar energy and gravity.

Offered: Contact department for information.















Students will examine and explain foundations of relational databases, familiarity and fundamentals of Structured Query Language (SQL) databases, and general database operations, and apply their skills using industry-standard software. Students will develop proficiency developing and managing both spatial databases and non-spatial databases.

Offered: Contact department for information.













The course examines how race, class, and gender have influenced environmental decision-making, and explores how groups of people that have been disproportionately affected by environmental problems have organized to address those issues. We examine how laws and policies contributed to environmental injustice, and how have they been used to achieve environmental and social equality. Students develop deeper understandings of the history of the environmental justice movement, contemporary environmental justice issues, and directions forward

for the field.

Offered: Contact department for information.













This course introduces fundamental remote sensing topics essential for monitoring the Earth's resources and characterizing environmental problems. We examine the interaction of electromagnetic radiation with the Earth's surface and atmosphere, and the platforms used to observe the Earth system. Students will be able to explain and apply digital image processing techniques and their theoretical underpinnings in the context of aerial images, satellite images, LIDAR, unmanned aerial vehicles, and ground-penetrating radar and make appropriate interpretations.

Offered: Winter

Prerequisites: GC 225; BI 412 or DATA 109 or

GC 235; junior standing









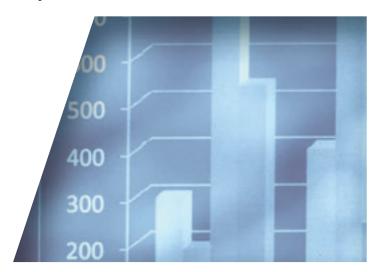




Geographic Information Systems (GIS) integrates data from social and environmental disciplines and offers powerful platforms for data analysis from a spatial vantage point. Students will examine the analytical capabilities of GIS and build their technical experience. Students will work through multiple hands-on exercises using ESRI ArcGIS Pro to develop proficiency with spatial data analysis techniques such as data assembly, interpolation, proximity analysis, and overlay analysis.

Offered: Winter

Prerequisites: GC 335 or GC 425















This course introduces students to fundamental topics in landscape ecology, the field concerned with the analysis of the relationship between ecological processes and spatial patterns on the Earth's surface at landscape scales. Students will become proficient with key concepts, methods of analysis, and their importance in land management and conservation. Students will use analysis operations and their theoretical underpinnings to explore pattern-process relationships relating to vegetation, climate, habitat fragmentation, fire, and invasive species.

Notes: Field work is required during scheduled labs.

Offered: Fall, even years only.

Prerequisites: GC 100 or BI 112, and GC 335;

or instructor permission













This course explores gender and the environment from an intersectional perspective. Through case studies ranging from the local to the global scale, we will discuss power, politics, identities, inequalities, social movements and ecological crises. This interdisciplinary course is for environmentalists, feminists, and any student curious about the interconnections between global environmental change and gender relations.

Offered: Every other year















Students study of the hydrologic cycle. Precipitation, runoff, interception and groundwater processes are addressed. Measurement techniques and analytical methods are also presented. Informed decision making with regard to the water cycle is stressed.

Notes: Field work is required. Contact instructor for more information.

Offered: Fall

Prerequisites: GC 100 or GC 255, MA 111 or MA 115 or higher, GC 225, EN 211, and junior standing or instructor's permission.















This course investigates the development and growth of environmental ethics. Various philosophical perspectives are discussed and analyzed in relation to understanding and resolving environmental and ecological controversies. Students develop their own individual ethical perspective and understanding of the environment.

Notes: Field work may be required. Contact instructor for more information.

Offered: Contact department for information.

Prerequisites: GC 101 and GC 205.















A field-based course in which students develop and write an environmental site assessment for a local property and an environmental impact assessment for a local project. Involves the laws, regulations and policies governing environmental decisions, especially the requirements mandated by the National Environmental Policy Act.

Offered: Contact department for information.

Prerequisites: GC 205 or BI 310 and senior standing, or instructor's permission. GC 320 recommended















Earth Systems Interactions focuses on research-oriented skills applicable to many physical and natural science careers. The course is designed to provide students with an applied understanding of research theory, a working knowledge of analysis and data visualization techniques, and an ability to interpret complex earth systems science data. GC 482 integrates a variety of professional skills required to conduct scientific investigations as an/a earth, environmental, geographical, or biological scientist.

Offered: Contact department for information.

Prerequisites: GC 205 and GC 235, and

junior standing















This course integrates techniques from earth and environmental science to provide capstone research experience. Incorporates relevant scientific approaches, emphasizes interdisciplinary connections, demonstrates quantitative methods and tools, promotes communication, and teaches professional skills relevant for earth or environmental scientists.

Notes: Field work may be required. Contact instructor

for more information.

Offered: Winter

Prerequisites: GC 205, GC 235, GC 335, and

24 GC credit hours; junior standing, or

instructor's permission















Students examine historical and contemporary roles of humans as a major agent of environmental change on Earth. Enables graduating students to combine academic interests, skills and experiences into a capstone project that is presented orally and in writing.

Notes: Field work may be required. Contact instructor for more information.

Offered: Winter

Prerequisites: GC 205, GC 235, and 24 GC

credit hours; junior standing or

instructor's permission















A practical experience with a private, municipal, county, state and/or federal agency. For every 40 hours worked, one credit may be earned. The minimum number of credits for GC 491 is 2, and the maximum is 6. Internships may be paid or unpaid. Students typically participate in internships during their junior or senior year so that they can apply what they have learned through coursework to a real-world setting.











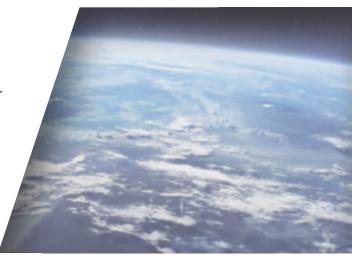




Special study of problems and/or regions that are not part of the regular offerings.

Notes: Field work may be required. Contact instructor for more information.

Offered: Contact department for information.















Major in earth science, environmental science, environmental studies and sustainability or Geographic Information Systems & Technology; or one of the department's minors; junior standing, or instructor's permission.















Data Science is an emerging discipline combining mathematics, statistics, and advanced programming to reveal unseen patterns in large datasets and derive useful information to solve problems and make decisions. The Data Science Club supports and connect students with resources that help them advance their skills in data analysis and GIS mapping and improve their marketability.















EcoReps is a fully funded interdisciplinary education program designed to give students the resources and knowledge to solve sustainability issues on-campus and in the larger community. Reps become informed and empowered peer-to-peer educators.

















QUALIFICATIONS FOR GTU

Each semester, students who meet the following criteria are invited to join:

- Successful completion of at least 3 semesters of college coursework AND 3 GC courses.
- A minimum GPA of 3.3 ("B" average) in GC courses; in top 35% of class.

















The NMU Conservation Crew is a student-led organization dedicated to preserving local land, uniting students and the Marquette community, and enhancing the public's environmental knowledge.

















GOAL

The Northern Michigan University Hoop House serves as a collaborative learning center for eaters of all ages who are curious about where food comes from and how it it grown. Through research and education on sustainable agriculture, the project aims to expand our local food system improve food security and increase access to fresh, healthy produce. The project aims to help current farmers, potential farmers and the greater community learn more about sustainableagriculture practices and using hoop houses to extend the growing season in a northern climate.















GOAL

The goal of NMU's Outdoor Learning Area (OLA) is to promote educational and recreational experiences by creating and managing sustainably designed multi-use outdoor spaces on campus and through instructive outreach. The OLA consists of the following areas: 1) Native Plant Park; 2) GeoPark; and 3) Eco-Park.



Students, faculty, and staff can:

- Engage in scientific hands-on examination of the phsyical and natural environment.
- Participate in native plant restoration and promote native pollinator species.
- Enjoy a relaxing lunch or study break.
- Explore natural and constructed spaces through coursework and research.













Rock and Mineral Club is a student organization focusing on the geology of our Marquette home. We have many outings throughout the year to put us one-on-one with the history and awesome geologic features right here in our backyard!

