

EARTH SCIENCE (GS)

GS-101 Physical Geography

LASC Categories: NSP

Geographic principles of location; characteristics of landforms, soil, climate, minerals, water, flora, and fauna. [Formerly GE101.]

Fall and Spring and every year. 3 Credits

GS-110 Meteorology

LASC Categories: NSP, QAC

Understanding the atmosphere and worldwide weather, Earth-Sun relationships, atmospheric humidity and precipitation, air pressure and winds, circulation of the atmosphere, climate change, air pollution, stratospheric ozone depletion, and extreme weather.

Fall and Spring and every year. 3 Credits

GS-140 Physical Geology

LASC Categories: LAB, NSP, QAC

Introduction to geological science: rocks and minerals, internal and external geologic processes, topographic map and air photo analysis, local field study. Three hours lecture and two hours laboratory per week.

Fall and Spring and every year. 4 Credits

GS-150 Humans and the Cold Regions

LASC Categories: NSP

Winter intersession. Examines earth's cold regions, including physical geography, cryosphere's role in earth systems, human adaptations. Includes outdoor activity.

3 Credits

GS-165 Geographic Information Systems I

LASC Categories: NSP, NLL

Introduction to the use of geospatial technologies including geographic information systems and GPS.

Fall and Spring and every year. 4 Credits

GS-180 Field Geoscience

LASC Categories: NSP, LAB

Field Geoscience course for EEP majors as well as non-majors. Course explores the intersection of human activities and the Earth's landscape and processes, with a basic introduction to topics in geology, mapping and landscape analysis. Includes lecture, labs and field activities.

Introductory lectures lab and field work on or near the Worcester State campus and then an overnight trip of 7-10 days.

Other or on demand and every 2-3 years. 4 Credits

GS-193 First Year Seminar in Geography

LASC Categories: FYS

Introductory level course covering topics of special interest to first-year students. Offered only as a First-Year Seminar.

3 Credits

GS-195 Special Topics

Introductory course to be offered on a trial basis. Topic to be announced in advance.

1-6 Credits

GS-210 Geomorphology

LASC Categories: NLL, QAC

Prerequisites: GS-101 or GS-140 and an accuplacer score of 3 or one college level Math course.

The study of landforms and the processes that form them. Labs focus on interpretation of maps and aerial photographs. Three hour lecture and two hour laboratory.

Every 2-3 years. 4 Credits

GS-217 Spatial Data Methods

LASC Categories: QR

Prerequisites: GS-165

Introduction to the methods used in GIS programming and quantitative geospatial analysis.

Every 2-3 years. 3 Credits

GS-218 Introduction to Remote Sensing

LASC Categories: NSP

Prerequisites: GS-101 or GS-140 or EV-150 or BI-101 or BI-140

Introduction to the use and analysis of remotely sensed images such as aerial photographs and satellite imagery.

Every 2-3 years. 3 Credits

GS-225 Oceanography

LASC Categories: QAC

Prerequisites: GS-101 or GS-140 or GS-110 or EV-150

The principles of physical, chemical, biological, and geological oceanography.

Spring only and every year. 3 Credits

GS-230 Biogeography

Prerequisites: GS-101 or GS-110 or BI-101 or BI-140

The distribution patterns of plants and animals, processes affecting this distribution, and how these patterns change in space and time.

Every 2-3 years. 3 Credits

GS-235 Contemporary Climate Change

Prerequisites: GS-101 or GS-110 or EV-150 or CH-106.

The global climate system, factors influencing climate, recent climate change and the role of human activity.

Every 2-3 years. 3 Credits

GS-240 Coastal Environments

Prerequisites: GS-101 or GS-140

Summer session course examining the physical geography of coastal environments including human impacts. Includes field trips.

3 Credits

GS-245 Planetary Geology

Prerequisites: GS-140 or PY-101

Solar system formation and evolution with emphasis on planetary interiors and surface features.

Every 2-3 years. 3 Credits

GS-250 Hydrology

Prerequisites: GS-101 or GS-140 or GS-110 or EV-150

Hydrologic processes, their estimation and measurement. Includes precipitation, evaporation, runoff, groundwater and water resources management.

Fall only and every year. 3 Credits

GS-260 Introduction to Soil Science

Prerequisites: GS-101 or GS-140

The study of the formation, processes, classification and composition of soils with emphasis on environmental applications, including watershed delineation.

Every 2-3 years. 3 Credits

GS-270 The Sedimentary Record

LASC Categories: NLL

Prerequisites: GS-140 and GS-101 or GS-110

Theoretical, laboratory, and field investigations of modern sedimentary processes, depositional environments, the sedimentary record of earth history, principals of stratigraphy. 3 hours lecture and 3 hours lab.

Every 2-3 years. 4 Credits

GS-299 Special Topics

Intermediate level course to be offered on a trial basis. Topic to be announced in advance.

1-6 Credits

GS-318 Geographic Information Systems II

Prerequisites: GS-165

Advanced production of digital choropleth maps on PCs using a GIS vector oriented software.

Every 2-3 years. 3 Credits

GS-328 Digital Landscape Analysis

Prerequisites: GS 165 and one 200 level GS course.

Computer based methods of representing, storing and analyzing landscape features. Explores technologies such as LiDAR and Unmanned Aerial Vehicles for gathering landscape data and the use of geospatial tools to analyze and represent landscape features. 3 hours of lecture and 2 hours of lab.

Every 2-3 years. 4 Credits

GS-335 Hydrogeology

Prerequisites: GS-140 or GS-250 and a math placement test score of 3, or a college level math course.

Underground water and its movement. Aquifer identification and test; wells, contamination and remediation, ground water as a geologic agent. Fall only and other or on demand. 3 Credits

GS-338 Atmospheric Sciences

Prerequisites: # GS-101 # Take CH-120 or CH-112;

Atmospheric Science introduces students to the physics and chemistry of the atmosphere, and examines the science behind current issues such as global climate change, air pollution, and reductions in stratospheric ozone. Atmospheric physics includes both weather (clouds, rain, winds) and climate (weather averaged over longer timescales, as well as trends in climate over time). Atmospheric chemistry investigates processes controlling the chemical composition of the atmosphere, including related processes in the and biosphere, as well as anthropogenic pollution (smog, stratospheric ozone loss, etc.)

Every 2-3 years. 3 Credits

GS-340 Special Topics: Advanced Earth Science

Advanced course to be offered on a trial basis. Topic to be announced in advance.

1-6 Credits

GS-348 Fundamentals of Earth Data Analytics

LASC Categories: NSP, QR, QAC

Prerequisites: GS-101 Take 1 course; From Subjects GS; From Levels 200;

The theory and practice of data analytics using remote sensing and in-situ earth observations, and communicating the science.

Fall only and every year. 4 Credits

GS-370 Lakes & Environmental Change

LASC Categories: WAC, NLL

Prerequisites: GS-140 Take one earth science course at the 200-level or above.

Modern physical, biogeochemical, and sedimentary processes in lakes. Lake sediments as archives of past climate and environmental change. Includes fieldwork.

Every 2-3 years. 4 Credits

GS-380 Advanced Field Geoscience

LASC Categories: NLL

Prerequisites: GS 140 and one other 200 level GS course.

Field Geoscience course for EEP majors. Course explores the intersection of human activities and the Earth's landscape and processes examining advanced topics in geology, mapping and landscape analysis. Includes lecture, labs and field activities. Introductory lectures lab and field work on or near the Worcester State campus and then an overnight trip to field sites, 1-10 days depending on the number of credits.

Other or on demand and every 2-3 years. 1-4 Credits

GS-400 Senior Seminar

LASC Categories: CAP

Prerequisites: GE-102 GS-101 GS-140 GS-165 and GE-200 and senior standing

Capstone course for geography majors. Students prepare a comprehensive term paper and present on the topic. Course includes portfolio and career development.

Fall and Spring and every year. 3 Credits

GS-408 Directed Study: Earth Science Or Geoscience

Directed study offers students, who because of unusual circumstances may be unable to register for a course when offered, the opportunity to complete an existing course with an established syllabus under the direction and with agreement from a faculty member.

Other or on demand and every year. 1-4 Credits

GS-410 Independent Study: Earth Science- Geoscience

Opportunity for advanced students to pursue an earth science or geoscience topic of special interest involving extensive reading, experimentation, and research.

Fall and Spring and every year. 1-4 Credits

GS-420 Advanced Geoscience Research and Fieldwork

Lab and or field-based research on a specific geoscience topic under supervision of a faculty member. [Permission of instructor.]

1-6 Credits

GS-450 Readings and Directed Research

Directed study on selected topics; open to senior majors. 3 Credits

GS-460 Internship: Geography

Students assigned to various government and private agencies under joint supervision of agency and faculty. Major GPA of 3.0 or above required.

Other or on demand. 1-6 Credits

GS-470 Selected Topics: Geography

Prerequisites: GS-101 and one course from GS-210, GS-225, GS-230, GS-235, GS-250, GS-260, GS-290 or GS-310

Topic or subject to be announced in advance; topic to be relevant to student needs and interests and availability of professor.

1-6 Credits