

## DEPARTMENT OF GEOGRAPHY AND GEOSCIENCES

### OVERVIEW

<https://www.uvm.edu/cas/geography>

Undergraduate and graduate students in the Department of Geography and Geosciences are travelers of the world, lovers of the outdoors, appreciators of diverse cultures, and close observers of our environment. Students and faculty have an insatiable curiosity for human behavior, the natural world, and their interconnectivity across time and space. The work of students and faculty in Geography spans the physical, social, and human sciences, while Geosciences investigates the interconnectedness of Earth layers including atmosphere, hydrosphere, biosphere, and geosphere, as well as other planetary systems.

Geography and Geosciences students pursue careers in fields as diverse as their passions and go on to be scientists and scholars, humanitarians and government officials, environmental organizers and activists, educators, innovators, consultants, and business leaders. They are working around the globe today, tackling urgent challenges like climate change, water quality, human migration, natural disasters, urban planning, and geopolitical conflict. Some are getting their hands dirty in the field, using advanced technological tools to collect and analyze data, while others are crafting public policy in the halls of Congress.

### MAJORS

#### GEOGRAPHY AND GEOSCIENCES MAJOR

Geography B.A.

Geosciences B.A.

Geosciences B.S.

### MINORS

#### GEOGRAPHY AND GEOSCIENCES MINORS

Geography Minor

Geosciences

Geospatial Technologies Minor

### GRADUATE

Geology M.S.

See the online Graduate Catalogue for more information

### Geography Courses

#### **GEOG 1010. Topics In: First-Year Seminar. 3 Credits.**

Intensive first-year seminar focused on specific themes and/or disciplinary perspectives. Emphasis on developing critical reading and writing skills, substantive revision, information literacy, and analytical thinking. First-year seminars are frequently organized to meet one of the disciplinary Catamount Core requirements. Topics vary by offering; periodic offering at intervals that may exceed four years. Catamount Core: S1, WIL1.

#### **GEOG 1014. Topics In: FYS: Sustainability. 3 Credits.**

Intensive first-year seminar focused on specific themes and/or disciplinary perspectives. Emphasis on developing critical reading and writing skills, substantive revision, information literacy, and analytical thinking. First-year seminars are frequently organized to meet one of the disciplinary Catamount Core requirements. Topics vary by offering; periodic offering at intervals that may exceed four years. Catamount Core: SU.

#### **GEOG 1020. Topics In: LASP Writing. 3 Credits.**

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program. Catamount Core: S1, SU, WIL1.

#### **GEOG 1025. Topics In: LASP Seminar. 3 Credits.**

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program.

#### **GEOG 1200. Weather, Climate & Landscapes. 3 Credits.**

Introduction to the fundamentals of weather, climate, landform evolution, and plant distribution using a systems approach. Focus on variation in processes over space and time. Catamount Core: N1.

#### **GEOG 1700. Topics in Human Geography. 3 Credits.**

Exploration of topics and issues in Human Geography, with an emphasis on Geography as a social science. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Catamount Core: S1.

#### **GEOG 1760. Global Environments & Cultures. 3 Credits.**

Introduction to Geography from global, place-based, cultural, and socio-environmental perspectives. Catamount Core: D2, S1, SU.

#### **GEOG 1770. Geography/Race&Ethnicity in US. 3 Credits.**

Examination of the ways in which spatial and locational processes shape and are shaped by ethnic and racial identities, struggles, and relationships. Cross-listed with: CRES 1861. Catamount Core: D1, S1.

**GEOG 1780. Society, Place, and Power. 3 Credits.**

An introduction to human geography: a spatial perspective on the study of population and migration, globalization, uneven economic development, geopolitics, cities and rural spaces, cultural meanings of place, and struggles for spatial justice. Catamount Core: S1, SU.

**GEOG 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOG 2230. Climatology: Concepts & Tools. 3 Credits.**

Quantitative analysis of the atmospheric-land-water processes that determine climate variability and change at the local to global scales. Historical and near real-time data manipulation via statistics, weather map interpretation, climate indices, modeling and remote sensing. Prerequisite: GEOG 1200.

**GEOG 2250. Global Environmental Change. 3 Credits.**

Explores changes in natural processes and anthropogenic activities that influence the atmosphere, hydrosphere, and biosphere individually and through interactions and feedbacks from a distinctly spatial perspective employed by physical geographers. Prerequisite: GEOG 1200 or ENSC 1010. Cross-listed with: ENSC 2480.

**GEOG 2510. Geog Info: Concepts & Applic. 0 or 3 Credits.**

Systematic approach to important geographical concepts (including distance, shape, scale dispersion) structured around the use of Geographical Information Systems (GIS) as an analytical tool. Credit not awarded for both GEOG 2510 and ANTH 2825 or NR 2430. Prerequisite: A Catamount Core WIL1 course. Catamount Core: QD.

**GEOG 2520. Remote Sensing. 0 or 3 Credits.**

Examinations of the earth's surface from aerial photographs and satellite imagery. Emphasis is on image interpretation, classification, change detection, multivariate analysis (e.g. principal components analysis). Prerequisite: Sophomore standing. Cross-listed with: NR 2460.

**GEOG 2550. Qualitative Research Methods. 3 Credits.**

Covers data collection, analysis, and representation techniques for qualitative data with emphasis on critical perspectives and cutting-edge practices, such as participatory mapping and mixed-methods approaches. Prerequisite: Minimum Sophomore standing. Catamount Core: WIL2.

**GEOG 2707. Restoration Cultures. 4 Credits.**

Social and cultural perspectives on human-environment interactions in the field of restoration ecology. Field-based course that engages students in place-based restoration work with community partners in natural areas. Draws on human geography, environmental history, natural history, environmental humanities, and restoration ecology. Prerequisite: NR 2300 or Instructor permission. Cross-listed with: ENVS 2982. Catamount Core: S1.

**GEOG 2715. The Circumpolar Arctic. 3 Credits.**

Examines the physical and human geography of the circumpolar Arctic. Prerequisite: GEOG 1200 or GEOG 1760.

**GEOG 2730. Topics in Int'l Field Studies. 3 Credits.**

Field course abroad. Intensive study of the geography of a country or region, with attention to related issues. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Minimum Sophomore standing; Instructor permission.

**GEOG 2760. Rural Geography. 3 Credits.**

Global, national and local scale study of rural landscapes, cultures, social issues, and environmental concerns. Prerequisite: GEOG 1760 or GEOG 1780. Cross-listed with: ENVS 2433. Catamount Core: S1.

**GEOG 2772. Historical Geography. 3 Credits.**

Examination of the tools, techniques, and perspectives used in studying the historic development of places and landscapes. Vermont and other North American case studies. Prerequisite: GEOG 1760 or GEOG 1780 or HST 1615.

**GEOG 2774. Gender, Space & Environment. 3 Credits.**

Examination of the ways in which human relationships to both the built and the natural environment are mediated by gender. Prerequisites: Six hours in Geography, Environmental Studies, or Gender, Sexuality, & Women's Studies. Cross-listed with: ENVS 2240, GSWS 2735.

**GEOG 2780. Political Ecology. 3 Credits.**

Human-environment interactions under globalization. The politics of using particular ideas of 'nature' for the benefit of some and to the detriment of others in spaces from local backyards to global contexts. Environmental movements and livelihoods. Prerequisites: GEOG 1760, GEOG 1780, or ENVS 1510; and ENSC 1010, ENVS 1500, GEOG 1200, GEOL 1025, GEOL 1040, GEOL 1055, GEOL 1400, or NR 2030. Cross-listed with: ENVS 2430.

**GEOG 2790. Urban Geography. 3 Credits.**

Analysis of the morphology, function and social structure of cities. Consideration of the nature, history and theories of urban growth and development. Prerequisite: GEOG 1760 or GEOG 1780.

**GEOG 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOG 3230. Topics in Climate & Water. 3 Credits.**

Analysis of regional climatology, paleoclimatology, hydroclimatological hazards, or fluvial geomorphology. Topics include droughts, severe weather, climate change, floods and floodplain management, mountain and lowland rivers. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Vary with course content; minimum Junior standing.

**GEOG 3250. Topics In Global Change. 3 Credits.**

Advanced offerings on topics related to past, present and future changes in the environment, including natural and human-induced changes in the atmosphere, hydrosphere and biosphere. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: Vary with course content; Minimum Junior standing.

**GEOG 3520. Topics in Remote Sensing. 3 Credits.**

Applied, capstone course; remote sensing techniques will be applied to atmospheric issues at varying temporal and spatial scales, as well as to quantifying the influence of topography, vegetation, and land-water boundaries. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: GEOG 1200; GEOG 2230, GEOG 2520, or NR 2460 recommended.

**GEOG 3760. Topics in Human Env Interact. 3 Credits.**

Advanced offerings on various manifestations of social-environmental relationships. Possible topics include sustainable development, environmental justice, and urban ecology. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Vary with course content; Minimum Junior standing.

**GEOG 3770. Topics in Space, Power, Identity. 3 Credits.**

Advanced offerings on topics related to the spatial regulation and geographic construction of social identity, paying particular attention to race, gender, and sexuality. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Vary with course content; minimum Junior standing.

**GEOG 3780. Topics in Pol Econ & Ecology. 3 Credits.**

Advanced offerings in political ecology and political economy, particularly at global and regional scales. Possible topics include Third World economic restructuring, globalization, international environmental movements. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Vary with course content; minimum Junior standing.

**GEOG 3790. Topics in Crit Urban&Soc Geog. 3 Credits.**

Advanced offerings in urban and critical social geography. Possible topics include social justice and the city, human rights, geographies of social control. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: Vary with course content; minimum Junior standing.

**GEOG 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOG 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**GEOG 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**GEOG 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**GEOG 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOG 4994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**GEOG 4996. Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.

**Geology Courses****GEOL 1010. Topics In: First-Year Seminar. 3 Credits.**

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**GEOL 1025. Topics In: LASP Seminar. 4 Credits.**

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program. Catamount Core: N2.

**GEOL 1040. Interdisciplinary Earth. 3 Credits.**

Introduces theory, practice, and real-world examples of advantages and challenges of interdisciplinary approaches. This includes an understanding of natural science principles, but also a critical interrogation of origins and issues related to the prevailing, often exclusive, culture in natural sciences. Drawing from examples in the geosciences and critical zone science, medicine, and engineering, students will be engaged in discussions on science, sustainability, data analyses, teamwork, and communication. Catamount Core: N1, QD, SU.

**GEOL 1055. Topics in Intro to Geo. 3 Credits.**

Exploration of geological processes and concepts. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years.

**GEOL 1100. Earth Through Time. 3 Credits.**

Discover Earth's record of over 4.5 billion years of history, spanning the formation of the planet and its building blocks to the evolution of continents, oceans, and the atmosphere. Topics include how geologic processes link to the formation of life, mass extinctions, natural resources and changing climate, how geoscientists decode the record of Earth's stories preserved by sediments, rocks, and fossils, and how different technologies provide a deeper understanding of Earth's dynamic history. Catamount Core: N1.

**GEOL 1400. Environmental Geology. 0 or 4 Credits.**

Introduction to geologic processes and materials pertinent to environmental problems: ground water movement, supply, and contamination, waste disposal, flooding, subsidence, and landslides. Local field trips. Designed for intended Natural Science majors. Catamount Core: N2.

**GEOL 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOL 2105. Earth Materials. 3 Credits.**

Exploration of the building blocks of the Earth (elements, minerals, and rocks) and their connection to the Earth's past, present, and possible sustainable future. No laboratory. Credit not awarded for both GEOL 2105 and GEOL 3105. Prerequisite: GEOL 1400 or Instructor permission. Catamount Core: N1, SU.

**GEOL 2400. Topics in Env't & Surface Geo. 3 Credits.**

Exploration of themes and concepts in environmental and surface geology. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: GEOL 1400.

**GEOL 2405. Environmental Geochemistry. 3 Credits.**

Application of many basic principles of chemistry to selected environmental problems in geosciences (e.g. acid mine drainage, carbon dynamics, weathering, and contaminant metal mobility). No laboratory. Credit not awarded for both GEOL 2405 and GEOL 3405. Prerequisite: A Catamount Core N1, N2, or MA course. Catamount Core: N1.

**GEOL 2410. Geohealth. 3 Credits.**

Exploration of the relationships between human health and geologic processes and materials, highlighting interfaces between the geosphere, hydrosphere, atmosphere, and biosphere. Examination of links between geologic processes and potential health hazards to which humans are exposed by air, food, water, or soil. Application of foundations of geologic and geochemical knowledge that affect health outcomes to understand impacts of natural and anthropogenic processes on public health and issues related to testing and regulation. Prerequisites: A Catamount Core N1 or N2 course, ENVS 1500, HSCI 1100, or HSOC 1700. Cross-listed with: ENVS 2630. Catamount Core: N1.

**GEOL 2525. Geocomputing. 3 Credits.**

Introduction to a variety of computing tools commonly used in sciences and geosciences in particular. Hands-on experience; real data are used to resolve specific problems. Prerequisite: A Catamount Core N1 or N2 course. Catamount Core: QD.

**GEOL 2605. Mars, Moons & Asteroids. 3 Credits.**

Space exploration is a relatively new human endeavor that has greatly improved our understanding of our own planet and solar system. For that reason, any human mission to the solar system will have geology as one of its primary goals. Dissecting the objectives, results, and conclusions of the most recent space missions to nearby Mars, Luna, and asteroids provides an opportunity to explore the geologic objects of the solar system to understand Earth processes. Prerequisite: A Catamount Core N1 or N2 course. Catamount Core: N1.

**GEOL 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOL 3105. Earth Materials w/lab. 0 or 4 Credits.**

Exploration of the building blocks of the Earth (elements, minerals, and rocks) and their connection to the Earth's past, present, and possible sustainable future. With laboratory. Credit not awarded for both GEOL 3105 and GEOL 2105. Prerequisite: GEOL 1400 or Instructor permission. Catamount Core: N2, SU.

**GEOL 3405. Environmental Geochem w/lab. 0 or 4 Credits.**

Application of many basic principles of chemistry to selected environmental problems in geosciences (e.g. acid mine drainage, carbon dynamics, weathering, and contaminant metal mobility). With laboratory. Credit not awarded for both GEOL 3405 and GEOL 2405. Prerequisite: A Catamount Core N1, N2, or MA course. Catamount Core: N2, OC.

**GEOL 3410. Geomorphology. 0 or 4 Credits.**

Examines, using lectures, labs, and field-based independent study research projects, processes which change Earth's surface and the history of landscape development. Considers fundamental geologic constraints on environmental problems. Prerequisite: GEOL 1400 or Instructor permission.

**GEOL 3515. Field Geology. 4 Credits.**

Geological evolution of western Vermont as seen through actual field mapping in the Burlington area. Specifically designed for sophomores majoring or minoring in Geosciences or related sciences. Prerequisite: GEOL 1025, GEOL 1100, GEOL 1400, or GEOG 1200; a Catamount Core N1 or N2 course.

**GEOL 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOL 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**GEOL 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**GEOL 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**GEOL 4105. Structural Geology. 0 or 4 Credits.**

Examines processes and problems concerning the mechanical behavior of the Earth's crust and surface. Includes rock deformation stress, strain, and the interpretation of geological structures. Prerequisites: GEOL 3515, GEOL 2105.

**GEOL 4110. Rock Chronicles. 3 Credits.**

Learn to reconstruct sagas of the solid Earth using a wide variety of evidence, often cryptic, preserved by rocks over the course of their fascinating tectonic histories. Learn to apply fundamental concepts of metamorphism and deformation to the discovery and interpretation of mineral assemblages and textures as clues to these histories via microscopy and assorted analytical techniques. Further explore methods by which absolute timing and rates of geologic processes can be quantified. Prerequisite: GEOL 2105 or GEOL 3105.

**GEOL 4405. Geochemistry of Natural Waters. 3 Credits.**

Basic concepts of chemical equilibria applied to natural waters, including thermodynamics, pH, oxidation-reduction, weathering, and solution equilibria. Prerequisite: A Catamount Core N1 or N2 course; a 2000-level course in the natural sciences. Catamount Core: N1, QD.

**GEOL 4510. Geomaterial Analysis. 3 Credits.**

Acquiring and mastering advanced knowledge and practical skills in the analysis and characterization of geological materials is fundamental to environmental investigations. Geomaterial is all inorganic material that constitutes the Earth layers. As such, virtually every research project in geosciences, engineering, environmental science, physical geography, archeology, etc., starts with a thorough characterization of geomaterials. Prerequisites: GEOL 2105, GEOL 2405, GEOL 3105, or GEOL 3405.

**GEOL 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**GEOL 4994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**GEOL 4996. Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.