

GEOLOGY

<http://www.uvm.edu/~geology/>

OVERVIEW

The Master of Science in geology is a rigorous research thesis program with grounding in related course work. Research programs include environmental geology; geomorphology; water resources; environmental (bio)geochemistry; mineralogy; sedimentary, igneous and metamorphic environments; geochronology and structural geology; tectonics; and the evolution of orogen. Examples of specific faculty interests include geologic history and recent sedimentation in the Lake Champlain Basin; processes and chronology of glaciation; stable and cosmogenic isotopic studies; water quality and pollutant transport; crystal chemistry and crystallography; mineral structure analysis; molecular-scale environmental mineralogy; (bio)geochemical cycling in the critical zone; the tectonic evolution of continental margins and interiors; petrofabric and structural analysis of deformed rocks; partial melting and deep crustal processes; timing of deformation and rates of tectonic processes; and stratigraphy and sedimentary environments of lower Paleozoic sandstones and carbonates.

DEGREES

- Geology M.S. (<http://catalogue.uvm.edu/graduate/geology/geologym/s/>)

FACULTY

Klepeis, Keith Andrew; Professor, Department of Geography and Geosciences; PHD, University of Texas Austin

Lini, Andrea; Associate Professor, Department of Geography and Geosciences; PHD, ETH-Zurich

Perdrial, Julia Nathalie; Assistant Professor, Department of Geography and Geosciences; PHD, Université Louis-Pasteur, Strasbourg, France

Perdrial, Nicolas; Research Assistant Professor, Department of Geography and Geosciences; PHD, Université Louis-Pasteur, Strasbourg, France

Schroth, Andrew W.; Research Associate Professor, Department of Geography and Geosciences; PHD, Dartmouth College

Webb, Laura E.; Associate Professor, Department of Geography and Geosciences; PHD, Stanford University

Courses

GEOL 201. Advanced Field Geology. 3 Credits.

Advanced field mapping techniques, analysis of field data, preparation of geological maps and reports. Prerequisite: GEOL 101.

GEOL 231. Petrology. 4 Credits.

The course covers the scope and methods of igneous, sedimentary and metamorphic petrology, and the geologic environments and processes relevant to the major rock types. Prerequisite: GEOL 110.

GEOL 234. Global Biogeochemical Cycles. 3 Credits.

Integrated perspective on biogeochemical cycles describing the transformation and movement of chemical substances in the natural environment, as seen on the global context. Prerequisite: CHEM 031.

GEOL 235. 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: Prerequisite: CHEM 032.

GEOL 240. Tectonics. 3 Credits.

Applications of igneous and metamorphic petrology to problems in tectonophysics, including petrochemistry of the earth's crust and upper mantle and the internal structure of orogenic belts. Prerequisites: GEOL 101, GEOL 110.

GEOL 246. X-ray Diffractometry. 3 Credits.

This course focuses on identification and characterization of materials using X-ray diffractometry. The course will include exercises using a modern powder diffractometer. Prerequisite: CHEM 032.

GEOL 249. Crystal Chemistry. 3 Credits.

A hands-on course involving crystal structure solutions, wherein grading will be based on various class projects, not examinations. Students will gain a deep understanding of how Nature arranges matter on Earth, and how to determine the atomic arrangement of compounds using X-ray diffractometry. Prerequisites: GEOL 110 or GEOL 246; or Chemistry, Physics, or Material Science major and minimum Junior standing; or graduate standing in Chemistry, Physics, or Material Science.

GEOL 260. 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 101, GEOL 110.

GEOL 263. Geochronology. 3 Credits.

This course will survey the basic concepts of radioactive decay, mass spectrometry, and isotopic systems commonly used to quantify the timing of geologic events. Prerequisite: GEOL 110.

GEOL 302. Intro Graduate Studies Geology. 1 Credit.

For first year graduate students in Geology. Includes orientation to faculty, abstract and grant writing, comprehensive exams, talk preparation and scientific method in the Geosciences. Prerequisite: Graduate standing in Geology.

GEOL 352. Environmental Geology Seminar. 1-3 Credits.

Geologic constraints on environmental problems including: groundwater flow, contaminant transport, slope stability, climate change, sedimentation, deforestation and earthquake hazards. Extensive readings and student-led discussions. Prerequisite: Graduate standing in science, natural resources, or engineering.

GEOL 355. Critical Writing in Science. 3 Credits.

Learn how to write better papers, give exciting presentations, and do peer-reviews. Write and review abstracts, articles, and professional presentations. Refine public science communication techniques including radio interviews and pitching work to the media. Takes a hands-on approach to improving science communication. Prerequisite: Graduate Student standing in science, mathematics, natural resources, agriculture and life sciences, plant and soil science, or engineering, or undergraduate thesis writers in these fields by Instructor permission.

GEOL 361. Advanced Structural Geology. 3 Credits.

Selected topics in analytical structural geology. Prerequisite: GEOL 260.

GEOL 371. Advanced Readings. 1-3 Credits.

Readings and research problems intended to contribute to the program of graduate students in areas of geology for which formal courses are not available. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: Graduate standing in Geology.

GEOL 390. 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 391. Master's Thesis Research. 1-9 Credits.

Master's Thesis Research.

GEOL 392. 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 394. Independent Graduate Research. 1-18 Credits.

Graduate 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 396. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

GEOL 397. Teaching Assistantship. 1-3 Credits.

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