

Geography

Geography (GEOG)

College of Arts and Sciences
Department of Geography
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The Department of Geography offers a major and minor in geography, as well as a Geographic Information Systems (GIS) minor (for non-geography majors) and a concentration area in GIS for majors. The GIS minor is well-adapted to majors in the physical and social sciences and complements studies in education, marketing, real estate, and entrepreneurship.

The department emphasizes GIS laboratory work, internships, collaborative faculty-student research and service learning to give our students a solid foundation in geographic principles and techniques, as well as an appreciation for the diversity of people and places. It makes extensive use of computer skills to explore a wide range of topics, from regional studies to remote sensing.

With foundations in both the natural and social sciences, geography prepares students for a wide range of careers in government, the private sector, and education. Geographers create digital maps, perform location analyses for retail and service stores, analyze land use and urban planning, work with census data, teach, and hold a wide variety of other jobs. Graduates also pursue advanced degrees in geography, business, urban and regional planning, community development, GIS, and natural resource management.

Major in Geography

GEOG 111 Human Geography (4 credits)
GEOG 112 Physical Geography (4 credits)
GEOG 113 World Geography (4 credits)
GEOG 480 Seminar in Geography (4 credits)

Plus eight credits in methods courses:

GEOG 221 Computer Skills in Geography (4 credits)
GEOG 222 Geographical Analysis (4 credits)
GEOG 223 Remote Sensing (4 credits)
GEOG 321 Geographic Information Systems (4 credits)
GEOG 421 Applied Geographic Information Systems (4 credits)

Plus four credits in a topical course:

ECON 333 Urban and Regional Economics (4 credits)
GEOG 230 Weather and Climate (4 credits)
GEOG 231 Global Migrations (4 credits)
GEOG 330 Geography for Business and Planning (4 credits)
GEOG 252 Geomorphology (4 credits)

Plus four credits in a regional course:

GEOG 297, 298 Topics (4 credits each)
GEOG 340 Geography of the U.S. and Canada (4 credits)
GEOG 384 Field Study in Geography (4 credits)

Plus:

Eight elective geography credits

Concentration in Geographic Information Systems (GIS)

Many fields use GIS, from the demographic and economic problems of marketing and store location to the natural resource management applications of erosion and groundwater modeling. Necessary subjects range from map projections and coordinate systems to remote sensing and database management. This concentration is open only to those students majoring in geography.

GEOG 111 Human Geography (4 credits)
GEOG 112 Physical Geography (4 credits)
GEOG 113 World Geography (4 credits)
GEOG 221 Computer Skills in Geography (4 credits)
GEOG 321 Geographic Information Systems (4 credits)
GEOG 330 Geography for Business and Planning (4 credits)
GEOG 421 Applied Geographic Information Systems (4 credits)
GEOG 480 Seminar in Geography (4 credits)

Plus four credits from the following:

GEOG 222 Geographical Analysis (4 credits)
GEOG 223 Remote Sensing (4 credits)

Plus four credits in a regional course:

GEOG 297, 298 Topics (4 credits each)
GEOG 340 Geography of the U.S. and Canada (4 credits)
GEOG 384 Field Study in Geography (4 credits)

Plus:

QMCS 220 Statistics I (4 credits)
QMCS 230 Software Design Using the JAVA Language (4 credits)

Minor in Geography

Eight credits in core courses
Eight credits in methods courses
Eight elective geography credits

Minor in Geographic Information Systems (GIS)

The GIS minor will appeal particularly to students majoring in geology biology, marketing, entrepreneurship, and sociology. This minor is only available to non-geography majors.

GEOG 221 Computer Skills in Geography (4 credits)
GEOG 321 Geographic Information Systems (4 credits)
GEOG 421 Applied Geographic Information Systems (4 credits)

Plus:

QMCS 230 Software Design Using the JAVA Language (4 credits)

Plus eight credits from the following methods courses:

GEOG 222 Geographical Analysis (4 credits)
GEOG 223 Remote Sensing (4 credits)
GEOG 330 Geography for Business and Planning (4 credits)
QMCS 220 Statistics I (4 credits)
QMCS 281 Object-oriented Design and Programming (4 credits)

Teacher Licensure

Elementary Education with a Specialty in Social Studies (5-8)
Co-major in Social Studies (5-12) and a Co-major in Secondary Education
See Education

GEOG 111 Human Geography (4 credits)

This course explores the effects of social, economic, environmental, political, and demographic change from a geographic perspective. It introduces students to a broad range of topics, including the effects of population growth, human impact on the environment, economic development, and globalization. Offered every semester. This course fulfills the Social Analysis and Human Diversity requirements in the core curriculum.

GEOG 112 Physical Geography (4 credits)

This course asks why the natural environment looks and acts the way it does and addresses the interrelationships between climate, soils, water, landforms, and the biosphere. The emphasis of the course is on natural processes with some discussion of how humans interact with their surroundings. Exercises from a lab manual written specifically for this course provide hands-on experiences through inquiry-based learning and GIS. This course fulfills the second-level Computer Competency requirement in the core curriculum.

GEOG 113 World Geography (4 credits)

A country-by-country study of the world. The goal of this course is to emphasize whatever best explains the character of each country. This may be population, economics, resources, or any aspect of nature or humanity that gives an insightful understanding of each country. Offered every semester. This course fulfills the Social Analysis and Human Diversity requirements in the core curriculum.

GEOG 221 Computer Skills in Geography (4 credits)

A course with an emphasis on useful computing, especially computer-generated maps. Topics include the basic operation of a computer, editors and word processing, spreadsheets, databases, graphics, thematic maps, map design, and webpage design. An applications-oriented course that teaches the use of ArcView GIS. Offered every semester. This course fulfills the second-level Computer Competency requirement in the core curriculum.

GEOG 222 Geographical Analysis (4 credits)

This course uses quantitative methods to explore questions of geographic concern. It focuses on collecting, organizing, analyzing and presenting spatial data. Statistical methods are applied in a real-world context - in the spheres of population, production, pollution, and climate change. This course fulfills the second-level Computer Competency requirement in the core curriculum.

GEOG 223 Remote Sensing (4 credits)

The principles and techniques of remotely sensed data are presented including photographic and digital sensing. The applicability of these techniques to land use analysis and environmental studies will be emphasized. Students will become familiar with aerial photography and digital imagery interpretation through inquiry-based learning and GIS. This course fulfills the second-level Computer Competency requirement in the core curriculum. Offered alternate years.

Geography

GEOG 230 Weather and Climate (4 credits)

The causes and consequences of weather and climate, from global-scale processes of climate dynamics, the greenhouse effect and El Niño to regional and local-scale processes of fronts, thunderstorms, hurricanes and tornadoes. Students are introduced to weather map analysis and simple forecasting and observational techniques.

GEOG 231 Global Migrations (4 credits)

This course explores the causes of migration today: post-colonial environmental exploitation, ecological degradation and resource scarcity in the developing world that create political and economic instability; declining populations in the developed world; globalization of human trafficking; and the resulting population movements from East to West, South to North.

GEOG 295, 296 Topics (2 credits)

GEOG 297, 298 Topics (4 credits)

The subject matter of these courses will vary from year to year, but will not duplicate existing courses. Descriptions of these courses are available at www.stthomas.edu/registrar/onlineschedule/.

GEOG 321 Geographic Information Systems (4 credits)

A sequel to GEOG 221, the theme of this course is how to perform data analysis using vector-based geographic information systems. Specific topics include spatial database operations, buffers, map overlay and address matching. The course illustrates the principles of Geographic Information Systems using workstation ArcInfo and a variety of real-world applications from demography to environmental studies. This course fulfills the second-level Computer Competency requirement in the core curriculum. Offered spring semester.

Prerequisite: A minimum grade of C- in GEOG 221 or consent of instructor

GEOG 330 Geography for Business and Planning (4 credits)

Geographic techniques for business and planning applications include demographic analysis of customer characteristics, consumer's geographic behavior, trade areas, patterns of retailing, store location problems, site appraisals, optimal routing, and marketing.

GEOG 340 Geography of the U.S. and Canada (4 credits)

What does the notion of "America" mean? How is this different from other global regions? This course examines the historical creation and expansion of North America from European, African and Asian influences. It then explores the contemporary geography of the continent: different cultural regions, economic characteristics, political variations, and places both special and commonplace that help define the North American experience. Usually offered alternate years.

GEOG 384 Field Study in Geography (4 credits)

A geographic analysis through field experience. Includes study-abroad courses.

Prerequisite: consent of instructor

GEOG 421 Applied Geographic Information Systems (4 credits)

A sequel to GEOG 321, this project-based course is designed around individual student interests to utilize advanced ArcGIS functions and analysis. Principles of geographic information systems will be implemented in a wide variety of applications. This course fulfills the second-level Computer Competency requirement in the core curriculum. Usually offered fall semester.

Prerequisite: GEOG 321 or consent of the instructor.

GEOG 475, 476 Experiential Learning (2 credits)

GEOG 477, 478 Experiential Learning (4 credits)

See the description of these courses at the beginning of the "Curricula" section of this catalog.

GEOG 480 Seminar in Geography (4 credits)

The seminar explores the nature of geography as a discipline. The areas to be covered: history of geographic thought, the position of geography relative to the arts and sciences, different ways of interpreting geographical phenomena, and geography as a vocational and academic career. Research projects will cover these themes and be tailored to the student's interests. Usually offered alternate years.

Prerequisites: four geography courses, including one methods course

GEOG 481 Advanced Field Study in Geography (4 credits)

A geographic analysis through field experience. Designed for advanced students in geography. Includes study-abroad courses.

Prerequisite: consent of instructor

GEOG 483, 484 Seminar (2 credits)

GEOG 485, 486 Seminar (4 credits)

See the description of these courses at the beginning of the "Curricula" section of this catalog.

GEOG 487, 488 Topics (2 credits)

GEOG 489, 490 Topics (4 credits)

The subject matter of these courses will vary from year to year, but will not duplicate existing courses. Descriptions of these courses are available at www.stthomas.edu/registrar/onlineschedule/.

GEOG 491, 492 Research (2 credits)

GEOG 493, 494 Research (4 credits)

See the description of these courses at the beginning of the “Curricula” section of this catalog.

GEOG 495, 496 Individual Study (2 credits)

GEOG 497, 498 Individual Study (4 credits)

See the description of these courses at the beginning of the “Curricula” section of this catalog.

Geology (GEOL)

College of Arts and Sciences

Department of Geology

Hickson (chair), Lamb, Theissen

Geologists study the Earth, not as a static lump of rock, but as a dynamic, changing system with a long, deep, and rich history. The science of geology focuses on the processes that have sculpted and continue to shape the planet and its life. The Department of Geology seeks to provide a solid foundation in the Earth sciences for its majors, preparing them for a variety of career paths.

The geology curriculum has been designed to provide students with a solid core, but with sufficient flexibility to allow students with particular interests to pursue a more customized program. At the heart of this program is the field laboratory experience, a fundamental and basic component of a St. Thomas geoscience degree. Department faculty emphasize the fact that geology must be learned in the field and as a result offer field laboratory experiences in all courses that extend from a short afternoon trip to a multi-week field course on field methods and regional geology. Majors will visit many of the geologically significant localities throughout the upper Midwest as part of their program.

Major in Geology (B.A.)

Four credits from the following:

GEOL 110 Geology of the National Parks (4 credits)

GEOL 111 Introductory Physical Geology (4 credits)

GEOL 113 The Earth’s Record of Climate (4 credits)

GEOL 114 The Science of Natural Disasters (4 credits)

GEOL 115 Environmental Geology (4 credits)

Plus:

GEOL 211 Earth Materials (4 credits) *or* GEOL 310 Environmental Geochemistry (4 credits)

GEOL 260 Regional Geology and Field Methods (4 credits)

GEOL 320 Sedimentology and Stratigraphy (4 credits)

GEOL 340 Fundamentals of the Lithosphere I (Petrology) (4 credits)

GEOL 360 Fundamentals of the Lithosphere II (Structural Geology) (4 credits)

GEOL 430 Advanced Earth History (4 credits)

Plus twelve credits from the following (four credits of which must be at the 400-level):

GEOL 130 Earth History (4 credits)

GEOL 211 Earth Materials (if not chosen above) (4 credits)

GEOL 220 Oceanography (4 credits)

GEOL 252 Earth Surface Processes and Geomorphology (4 credits)

GEOL 310 Environmental Geochemistry (4 credits) (if not chosen above)

GEOL 410 Hydrogeology (4 credits)

GEOL 460 Advanced Field Methods (4 credits)

GEOL 494 Research (4 credits)

Note: GEOG 321 Geographic Information Systems and geology courses offered at Macalester College may fulfill one of these courses with permission of chair

Allied requirements

MATH 113 Calculus I (4 credits)

or

MATH 108 Calculus with Review I (4 credits) *and* MATH 109 Calculus with Review II (4 credits)

Plus one of the following sequences:

CHEM 111 General Chemistry I (4 credits) *and* CHEM 112 General Chemistry II (4 credits)

PHYS 111 Introduction to Classical Physics I (4 credits) *and* PHYS 112 Introduction to Classical Physics II (4 credits)

CHEM 111 General Chemistry I (4 credits) *and* PHYS 111 Introduction to Classical Physics I (4 credits)

For students wishing to pursue careers in paleontology, geobiology, or geomicrobiology:

BIOL 201 Diversity and Adaptation (4 credits) *and* BIOL 202 Genetics and Population (4 credits)

Biology may be substituted for one of the CHEM/PHYS sequences with permission of chair