

College of Arts and Sciences – Departments

Geography (GEOG)

Lorah (chair), Kelley, Werner

The interdisciplinary field of geography studies both the human and physical elements of the landscape by focusing on the interaction between populations, economies, cultures and the environment. Many complex contemporary problems and issues exist within a spatial context, and geography is uniquely suited to their exploration and resolution.

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 classroom and laboratory work, field experience, internships, collaborative faculty-student research and community service 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, architecture, business, urban and regional planning, community development, GIS, and natural resource management.

Geography Honor Society

The honor society in geography at St. Thomas is *Mu Alpha Pi*. The purpose of the society is to further the professional development of geographers through research and academic experiences outside the classroom and laboratory. Students are eligible for membership when they have taken three courses in geography with at least a B average and rank in the upper 35 percent of their class.

Major in Geography

- 111 Human Geography
- 112 Physical Geography
- 113 World Geography
- 480 Seminar in Geography

Plus eight credits in methods courses:

- 221 Computer Skills in Geography
- 222 Geographical Analysis
- 223 Remote Sensing
- 321 Geographic Information Systems
- 421 Advanced Geographic Information Systems

Plus four credits in a topical course:

- ECON 333 Urban and Regional Economics
- GEOG 230 Weather and Climate
- GEOG 330 Geography for Business and Planning
- GEOG 430 Urban Geography
- GEOL 252 Geomorphology

Plus four credits in a regional course:

- 240 Geography of East and Southeast Asia
- 241 Geography of Minnesota
- 340 Geography of the U.S. and Canada
- 384 Field Study in Geography

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.

- 111 Human Geography
- 112 Physical Geography
- 113 World Geography
- 221 Computer Skills in Geography
- 321 Geographical Information Systems

- 330 Geography for Business and Planning
- 421 Advanced Geographic Information Systems
- 480 Seminar in Geography

Plus four credits from the following:

- 222 Geographical Analysis
- 223 Remote Sensing

Plus four credits in a regional course:

- 240 Geography of East and Southeast Asia
- 241 Geography of Minnesota
- 340 Geography of the U.S. and Canada
- 384 Field Study in Geography

Plus:

- QMCS 220 Statistics I
- QMCS 230 Software Design Using the JAVA Language

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.

- 221 Computer Skills in Geography
- 321 Geographic Information Systems
- 421 Advanced Geographic Information Systems

Plus:

- QMCS 230 Software Design Using the JAVA Language

Plus eight credits from the following methods courses:

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

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 School of Education Department of Teacher Education

111 Human Geography

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. Usually offered every semester. This course fulfills the Social Analysis and Human Diversity requirements in the core curriculum.

112 Physical Geography

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.

113 World Geography

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. Usually offered every semester. This course fulfills the Social Analysis and Human Diversity requirements in the core curriculum.

221 Computer Skills in Geography

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. This course fulfills the second-level Computer Competency requirement in the core curriculum.

College of Arts and Sciences – Departments

222 Geographical Analysis

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. Usually offered alternate years.

Recommended: 221 or consent of instructor.

223 Remote Sensing

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. Usually offered spring semester.

230 Weather and Climate

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.

240 Geography of East and Southeast Asia

A regional study of East and Southeast Asian countries with special emphasis on China and Japan. The course examines the resources and physical geography but emphasizes the population, culture and economy in this dynamic region of the world. Usually offered alternate years.

241 Geography of Minnesota

Minnesota is a land rich with diversity. In this course, students will explore the state's people, landscapes, natural resources, rural issues, economic opportunities, and many other aspects of Minnesota. The course will examine regional and topical issues to develop an understanding of what makes Minnesota unique. This will be accomplished through class discussions, hands-on activities, and readings.

295, 296 Topics

2 credits

297, 298 Topics

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.html.

321 Geographic Information Systems

A sequel to 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. Usually offered spring semester.

Prerequisite: A minimum grade of C- in 221

330 Geography for Business and Planning

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.

340 Geography of the U.S. and Canada

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.

384 Field Study in Geography

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

Prerequisite: consent of instructor

421 Advanced Geographic Information Systems

A sequel to 321, this course uses Spatial Analyst to illustrate advanced uses of computers in raster-based spatial analysis. Principles of geographic information systems will be implemented in a wide variety of applications using Spatial Analyst. This course fulfills the second-level Computer Competency requirement in the core curriculum. Usually offered fall semester.

Prerequisite: A minimum grade of C- in 321

Geology

430 Urban Geography

This course will focus on themes in the development of contemporary cities with special attention to patterns and trends within the Twin Cities metropolitan area e.g. ethnicity, housing, transportation, historical evolution, and urban growth. Usually offered alternate years.

Prerequisite: 111 or 113 or consent of instructor

475, 476 Experiential Learning

2 credits

477, 478 Experiential Learning

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

480 Seminar in Geography

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

481 Advanced Field Study in Geography

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

Prerequisite: consent of instructor

483, 484 Seminar

2 credits

485, 486 Seminar

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

487, 488 Topics

2 credits

489, 490 Topics

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.html.

491, 492 Research

2 credits

493, 494 Research

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

495, 496 Individual Study

2 credits

497, 498 Individual Study

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

Geology (GEOL)

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

One of:

110 Geology of the National Parks

111 Introductory Physical Geology

113 The Earth's Record of Climate

114 The Science of Natural Disasters

115 Environmental Geology

Plus:

211 Mineralogy

260 Regional Geology and Field Methods

320 Sedimentology and Stratigraphy

340 Fundamentals of the Lithosphere I (Petrology)

360 Fundamentals of the Lithosphere II (Structural Geology)

430 Advanced Earth History