

## Geography

College of Social & Behavioral Sciences  
Department of Geography  
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Chair: Donald A. Friend

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Both a social and natural science seeking to understand the interactions between people and their environment, Geography examines the distribution of physical and cultural phenomena across the Earth. Divided into two main parts, cultural and physical geography, cultural geography explores the characteristics of societies including demographics, religion, economy, and government and how these traits diffuse or contract across space and time. Physical geography examines landforms, climate, flora and fauna along with natural resources and the processes governing their distributions and use. Explored together in regional geography, the cultural and physical traditions are supplemented by cutting edge geospatial technologies (GIS and GPS), which provides students with skills highly prized in the work force. The Department of Geography offers a full suite of courses covering the cultural, physical, and regional and geospatial branches of geography at the undergraduate and graduate levels.

The majors, minor and Geographic Information Science Certificate offered by the Department provide background and training that enable students to enter careers in the public or private sectors as well as prepare them for graduate study.

**Admission to Major.** Students enrolling in 300-400 level courses must be admitted to the program. Admission to major is granted by the department. Minimum university admission requirements are:

- a minimum of 32 earned semester credit hours.

- a minimum cumulative GPA of 2.00 ("C").

Contact the department for application procedures.

COMBINED BS GEOGRAPHY AND MA URBAN PLANNING LEADING TO ACCELERATED COMPLETION OF MASTER'S DEGREE

Geography and Urban Studies share an arrangement for an accelerated Bachelor's/Master's degree program. Undergraduate students in Geography with a GPA of at least 3.0 can apply to the accelerated program in their Junior year. If accepted, in their Senior year they petition to take three Geography courses at the graduate level, and those courses are then included in both their undergraduate program and in the Master's of Urban Planning program. Contact either department for specific information.

### POLICIES/INFORMATION

**GPA Policy.** A GPA of 2.0 or higher in a major or minor in geography is required for graduation.

Refer to the College regarding required advising for students on academic probation.

**Pass/No Credit Policy.** P/N grading will be accepted in the major only for GEOG 401 and GEOG 497 and GEOG 409 at instructor discretion. All other courses must be taken for letter grades. All courses for the minor must be taken for letter grades.

### GEOGRAPHY BA

#### Major Common Core

GEOG 101 Introductory to Physical Geography (3)  
GEOG 103 Introductory Cultural Geography (3)  
GEOG 340 United States (3)  
GEOG 370 Cartographic Techniques (4)  
GEOG 401 Colloquium (1)

#### Major Restricted Electives

Cultural-Systematic (Choose 3 credits)

GEOG 425 Economic Geography (3)

GEOG 435 Urban Geography (3)

GEOG 437 Political Geography (3)

GEOG 438 Social Geography (3)

Physical (Choose 3 credits)

Students taking GEOG 217 are encouraged to take GEOG 218

GEOG 217 Weather (3)

GEOG 218 Weather Laboratory (1)

GEOG 313 Natural Disasters (3)

GEOG 315 Geomorphology (3)

GEOG 410 Climatic Environments (3)

GEOG 414 Biogeography (3)

GEOG 420 Conservation of Natural Resources (3)

Foreign Regional (Choose 3 credits)

GEOG 445 Latin America (3)

GEOG 446 Canada (3)

GEOG 450 Europe (3)

GEOG 454 Russian Realm (3)

GEOG 456 Africa (3)

GEOG 458 Geography of East Asia (3)

Capstone Experience (Choose 1-4 credits)

GEOG 440 Field Studies (1-4)

GEOG 480 Seminar (1-4)

GEOG 491 Senior Paper (1-4)

GEOG 497 Internship (1-10)

#### Major Unrestricted Electives

Additional Electives (Choose 1-8 credits):

Total credits in major must equal or exceed 32. Take number of credits needed to reach 32.

GEOG 200-499

**Required for Bachelor of Arts (BA) degree ONLY:** Language (8 credits)

**Required Minor. Yes. Any.**

### PROFESSIONAL BA

#### Major Common Core

GEOG 101 Introductory to Physical Geography (3)

GEOG 103 Introductory Cultural Geography (3)

GEOG 340 United States (3)

GEOG 370 Cartographic Techniques (4)

GEOG 401 Colloquium (1)

#### Major Restricted Electives

Cultural-Systematic (Choose 3 credits)

GEOG 425 Economic Geography (3)

GEOG 435 Urban Geography (3)

GEOG 436 Rural Geography (3)

GEOG 437 Political Geography (3)

GEOG 438 Social Geography (3)

Physical (Choose 3 credits)

Students taking GEOG 217 are encouraged to take GEOG 218

GEOG 217 Weather (3)

GEOG 218 Weather Laboratory (1)

GEOG 313 Natural Disasters (3)

GEOG 315 Geomorphology (3)

GEOG 410 Climatic Environments (3)

GEOG 414 Biogeography (3)

GEOG 420 Conservation of Natural Resources (3)

Foreign Regional (Choose 3 credits)

GEOG 445 Latin America (3)

GEOG 446 Canada (3)

GEOG 450 Europe (3)

GEOG 454 Russian Realm (3)

## GEOGRAPHY

- GEOG 456 Africa (3)  
GEOG 458 Geography of East Asia (3)  
Capstone Experience (Choose 1-4 credits)  
GEOG 440 Field Studies (1-4)  
GEOG 480 Seminar (1-4)  
GEOG 491 Senior Paper (1-4)  
GEOG 497 Internship (1-10)

### Major Unrestricted Electives

Additional Electives (Choose 15-24 credits)

Total credits in major must equal or exceed 48. Up to 6 elective credits may be taken outside Geography with departmental permission.

GEOG 200-499

### Other Graduation Requirements

**Required for Bachelor of Arts (BA) degree ONLY:** Language (8 credits)

**Required Minor. None.**

## GEOGRAPHY BS

### Major Common Core

- GEOG 101 Introductory to Physical Geography (3)  
GEOG 103 Introductory Cultural Geography (3)  
GEOG 340 United States (3)  
GEOG 370 Cartographic Techniques (4)  
GEOG 401 Colloquium (1)

### Major Restricted Electives

Cultural-Systematic (Choose 3 credits)

- GEOG 425 Economic Geography (3)  
GEOG 435 Urban Geography (3)  
GEOG 437 Political Geography (3)  
GEOG 438 Social Geography (3)

Physical (Choose 3 credits)

Students taking GEOG 217 are encouraged to take GEOG 218

- GEOG 217 Weather (3)  
GEOG 218 Weather Laboratory (1)  
GEOG 313 Natural Disasters (3)  
GEOG 315 Geomorphology (3)  
GEOG 410 Climatic Environments (3)  
GEOG 414 Biogeography (3)  
GEOG 420 Conservation of Natural Resources (3)

Foreign Regional (Choose 3 credits)

- GEOG 445 Latin America (3)  
GEOG 446 Canada (3)  
GEOG 450 Europe (3)  
GEOG 454 Russian Realm (3)  
GEOG 456 Africa (3)  
GEOG 458 Geography of East Asia (3)

Capstone Experience (Choose 1-4 credits)

- GEOG 440 Field Studies (1-4)  
GEOG 480 Seminar (1-4)  
GEOG 491 Senior Paper (1-4)  
GEOG 497 Internship (1-10)

### Major Unrestricted Electives

Additional Electives (Choose 1-8 credits):

Total credits in major must equal or exceed 32. Take number of credits needed to reach 32.

GEOG 200-499

## PROFESSIONAL BS

### Major Common Core

- GEOG 101 Introductory to Physical Geography (3)  
GEOG 103 Introductory Cultural Geography (3)  
GEOG 340 United States (3)  
GEOG 370 Cartographic Techniques (4)  
GEOG 401 Colloquium (1)

### Major Restricted Electives

Cultural-Systematic (Choose 3 credits)

- GEOG 425 Economic Geography (3)  
GEOG 435 Urban Geography (3)  
GEOG 436 Rural Geography (3)  
GEOG 437 Political Geography (3)  
GEOG 438 Social Geography (3)

Physical (Choose 3 credits)

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- GEOG 217 Weather (3)  
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GEOG 414 Biogeography (3)  
GEOG 420 Conservation of Natural Resources (3)

Foreign Regional (Choose 3 credits)

- GEOG 445 Latin America (3)  
GEOG 446 Canada (3)  
GEOG 450 Europe (3)  
GEOG 454 Russian Realm (3)  
GEOG 456 Africa (3)  
GEOG 458 Geography of East Asia (3)

Capstone Experience (Choose 1-4 credits)

- GEOG 440 Field Studies (1-4)  
GEOG 480 Seminar (1-4)  
GEOG 491 Senior Paper (1-4)  
GEOG 497 Internship (1-10)

### Major Unrestricted Electives

Additional Electives (Choose 15-24 credits)

Total credits in major must equal or exceed 48. Up to 6 elective credits may be taken outside Geography with departmental permission.

GEOG 200-499

## GEOGRAPHIC INFORMATION SCIENCE (GISc) CERTIFICATE

(18-20 Credits)

Students will receive a fundamental knowledge and understanding of Geographic Information Systems (GIS) and Remote Sensing technologies with the option to focus more intensively on advanced GIS, Remote Sensing or Global Positioning Systems (GPS) principles and applications.

### Major Common Core

- GEOG 373 Introduction to Geographic Information Systems (4)  
GEOG 473 Intermediate GIS (4)  
GEOG 474 Introduction to Remote Sensing (4)

**Major Restricted Electives** (Choose 6-8 credits)

- GEOG 480 must be the "Seminar: Environmental Hazards"  
GEOG 439 Transportation Modeling & GIS (4)  
GEOG 471 Digital Field Mapping with GPS (4)  
GEOG 475 Applied Remote Sensing & GIS (4)  
GEOG 476 Spatial Statistics (3)  
GEOG 478 Spatial Analysis with GIS (3)  
GEOG 479 GIS Practicum (1-4)  
GEOG 480 Seminar (1-4)

## GEOGRAPHY MINOR (18 credits)

**Required for Minor** (Core, 9 credits)

- GEOG 101 Introductory to Physical Geography (3)  
GEOG 103 Introductory Cultural Geography (3)  
GEOG 340 United States (3)

### Minor Electives

Choose 9 credits from GEOG 200 - GEOG 499

## COURSE DESCRIPTIONS

**GEOG 100 (3) Elements of Geography**

An introduction to Geography and its themes of study. The course will familiarize students with where places are located in the world together with their cultural and physical features. Students will be tasked to think critically and diversely about various cultures and features of the modern world.

Fall, Spring  
GE-8, GE-10

Diverse Cultures - Purple

**GEOG 101 (3) Introductory to Physical Geography**

Survey of the processes and features of the earth's physical environment, earth-sun relationships, weather, climate, natural vegetation, soil, and landforms. Examines their interrelations and spatial distribution using North America and world-wide examples. Some coverage of human-environmental relations.

Fall, Spring  
GE-3, GE-10

**GEOG 103 (3) Introductory Cultural Geography**

Cultural aspects of interactions between people and their environment focusing on spatial patterns of population, agriculture, politics, language, religion, industrialization, and urbanization. Emphasis is placed on the processes that create the cultural landscape and on management of land and natural resources.

Fall, Spring  
GE-5, GE-8

Diverse Cultures - Purple

**GEOG 210W (3) Landscapes and Places**

Introduction to the concepts of landscape and place in a variety of geographical writings. Emphasizes works with strong regional overtones. The interaction between the physical and cultural environments is paramount. Field observation and integrating imagery into original student writing documents is also addressed. WI, GE-10

**GEOG 217 (3) Weather**

An examination of the processes involved in weather formation. Students will be introduced to weather map analysis, simple forecasting and observational techniques, and weather instruments.

Fall, Spring

**GEOG 218 (1) Weather Laboratory**

Covers applied aspects of weather, including understanding weather codes, analysis and interpretation of weather maps, basic techniques of forecasting, and familiarity with weather instruments.

Fall, Spring

**GEOG 299 (1-3) Individual Study**

An assignment that is tailored to individual needs of a student. The instructor and the student arrange the type of project for the student, such as a term paper, readings, mapping, field investigation, or computer cartography.

Pre: Consent

Fall, Spring

**GEOG 313 (3) Natural Disasters**

An examination of the underlying causes of natural disasters occurring over the globe. Focus will be primarily upon weather and climate related disasters. Students will also be exposed to concepts of plate tectonics and how these affect the distribution of earthquakes and volcanism over the planet.

Variable

**GEOG 315 (3) Geomorphology**

Covers elements of the structure of the earth and the variety of landforms found on the earth's surface, with emphasis upon the processes, both past and present, that act upon the surface to create the landforms now visible. Local field trips.

Fall

**GEOG 340 (3) United States**

Students will develop a knowledge of the similarities and contrasts in regional landscapes and cultures of the United States.

Fall, Spring

**GEOG 341 (3) World Regional Geography**

Differences and similarities in the cultural and natural environments by the world's major regions. Useful survey of world geography for educators and international relations students.

Fall, Spring

**GEOG 342 (3) Geography of Minnesota**

The course involves the natural and human environments of Minnesota. The physical resources, population history, and current issues are emphasized.

Spring

**GEOG 370 (4) Cartographic Techniques**

The lecture material addresses map projections, technology changes in production, basic analysis and depiction of quantitative point, line and areal data. Also, the evaluation of maps and the history of cartography from a European, Oriental, and American Indian perspective is discussed. All maps are drawn using computer assistance.

Fall, Spring

**GEOG 373 (4) Introduction to Geographic Information Systems**

The course will be an introduction to the analysis of spatial data using the concept of a geographic information system (GIS). Content of the course will be, to a great extent, based on the NCGIA core curriculum with assignments tailored to the data and software available within the department such as ArcGIS.

Fall, Spring

**GEOG 401 (1) Colloquium**

Overview of geographic work, interests, and research by guest speakers.

Fall

**GEOG 409 (1-4) Selected Topics**

The instructor will develop a specific course on a geographic topic, such as soils, landforms, water resources, energy, housing, population geography, or some other topic for the class.

Fall, Spring

**GEOG 410 (3) Climatic Environments**

The characteristics of particular climates and understanding the factors that control their spatial distribution.

Pre: GEOG 101, or consent

Fall

**GEOG 412 (4) Advanced Weather**

Meteorological principles and theory are applied to the analysis and interpretation of weather data in order to better understand the structure and evolution of synoptic-scale weather systems. Basic knowledge of mathematics will be assumed.

Pre: GEOG 217

ALT-Fall

**GEOG 414 (3) Biogeography**

Analyzes the distribution and concentration of plants and animals throughout the world. Emphasis is placed on the role of evolution, tectonics, and physical barriers to the distribution and migration of species. Special emphasis is placed on the role of humans in the modern redistribution of species.

Fall

**GEOG 420 (3) Conservation of Natural Resources**

Survey of natural resources emphasizing energy, minerals, soils, fisheries, and water resources. Also addresses timber, wetlands, and wildlife on public and private lands.

Spring

**GEOG 425 (3) Economic Geography**

Examines national and international economic geographical order and trade activities. Topics include economic development, competition, international trade, and impacts on the environment and people.

**GEOG 430 (3) Historical Geography of the United States**

The evolving patterns of settlement, cultures, landscapes, and economies of the United States from the colonial period to 1990. An introduction to historical geography as a sub field of geography, including career opportunities in related professions.

On Demand

**GEOG 435 (3) Urban Geography**

Hypotheses and generalization related to urban functions, structure, land use, distribution, growth, and sometimes decline. Emphasis will be mostly on the United States' urban places.

Fall

**GEOG 436 (3) Rural Geography**

Introduction to theoretical frameworks for analyzing processes of economic, environmental, and social change in rural regions. Includes basic and advanced geographical principles and techniques for studying non-urban areas. Designed to equip students with the knowledge and skills necessary for carrying out research projects on rural environments.

Spring

**GEOG 437 (3) Political Geography**

Spatial problems and structure of governments, focusing on countries of the world and their geographic internal order. Covers such topics as boundary problems, strategic locations, and geopolitical explanations of international and internal relations and conflicts.

Spring

**GEOG 438 (3) Social Geography**

Concepts and theories concerning global and national social problems and the significance of geographic analytic methods for social research. Study of factors related to variations in regional standards of living.

Fall

**GEOG 439 (4) Transportation Modeling & GIS**

Four major sets of ideas will be covered: Introduction to Spatial Organization, Network Analysis, Allocation Methods, and Urban Transportation. The emphasis is on these approaches to understanding the geography of transport by description, explanation, and normative or optimal methods.

Fall

**GEOG 440 (1-4) Field Studies**

Various excursions to study physical and cultural landscapes inside and outside of Minnesota.

Variable

**GEOG 445 (3) Latin America**

Regional geography covering the ecological and human environment of Middle and South America, including the Caribbean. Students can pick specific topics to study in detail. The geographic relations between the USA and Latin America are also covered.

Fall

**GEOG 446 (3) Canada**

Students will develop a knowledge of the environmental, cultural, historical, and economic geographies of Canada. Readings of bestselling fiction and scholarly works written by Canadians will provide a Canadian perspective on the nation's past, present, and future.

ALT-Fall

**GEOG 450 (3) Europe**

Cultural, environmental, and economic background of Europe west of Russia and Ukraine. Following a general geographic survey, the course will cover major regions and countries.

Spring

**GEOG 454 (3) Russian Realm**

Survey of the area of Russia and her neighbors. Examines regional patterns of the physical environment, natural resources, population distribution, cities, and economic activity. Relates people to the land.

Variable

**GEOG 456 (3) Africa**

A survey of the physical and cultural resources and economic development of the continent with emphasis on current issues. Topics discussed will focus on Africa south of the Sahara.

Variable

**GEOG 458 (3) Geography of East Asia**

Examines the physical and human environments of eastern Asia, mainly China, Korea and Japan. The class will be assisted by visual sources and hands-on use of primary documents.

Variable

**GEOG 460 (3) Geography Teaching Methods**

The course will cover resource materials and current techniques in classroom teaching.

Variable

**GEOG 464 (4) Teaching Earth Science**

An applied course tailored to meet practical needs of a teacher, related to curriculum development and earth science lab equipment and supplies.

Variable

**GEOG 471 (4) Digital Field Mapping with GPS**

This course covers the basic strategies for field mapping using data acquired from global positioning systems (GPS).

Pre: GEOG 373 or equivalent

Fall

**GEOG 473 (4) Intermediate GIS**

Comprehensive examination of computer-assisted systems for manipulation and analysis of spatially-referenced data, including data structure and organization, input and output problems, data management, and strategies for analytical work.

Pre: GEOG 373

Spring

**GEOG 474 (4) Introduction to Remote Sensing**

This is an introductory course on theories and techniques of remote sensing. Focus will be placed on providing students with a general overview of the application of remote sensing to practical problems, and hands-on experience for image processing and analysis.

Fall

**GEOG 475 (4) Applied Remote Sensing & GIS**

This course provides students the opportunity to develop further knowledge of remote sensing. Emphasis will be placed on introducing advanced theories and techniques for digital image processing and helping students obtain independent research skills using remote sensing data.

Pre: GEOG 373, GEOG 474

Spring

**GEOG 476 (3) Spatial Statistics**

Descriptive statistics, probability, hypothesis testing, introduction to non-parametric statistics, correlation, introduction to regression analysis, spatial statistics, and principles of data representation in graphs and tables.

Spring

**GEOG 477 (1-3) Topics in Techniques**

This offering will include a variety of selected technical topics in geography, including but not necessarily limited to manual cartographic drafting and negative scribing, photomechanical techniques in production cartography, aerial photo interpretation, and advanced coverage of digital analysis of satellite-derived remote sensor data and global positioning systems.

Pre: Consent  
Variable

**GEOG 478 (3) Spatial Analysis with GIS**

Introduction to theoretical frameworks for spatial analysis and geographic quantitative methods. Includes basic and advanced geographic principles and techniques for studying spatial patterns. Designed to equip students with the skills necessary to carry out research projects that demand advanced statistics.

**GEOG 479 (1-4) GIS Practicum**

This offering will include supervised project work in raster-based and/or vector-based GIS, using problems and data drawn from local or regional agencies or other professional-level organizations with whom the Geography Department maintains a relationship. Students must have completed one of the prerequisite courses, or professional-level experience.

Pre: GEOG 373 or GEOG 473, or consent  
Variable

**GEOG 480 (1-4) Seminar**

Topics vary in physical, cultural, economic, political, and historical geography, as well as environmental conservation and geographic techniques.

Pre: GEOG 373  
Variable

**GEOG 491 (1-4) Senior Paper**

Fall, Spring

**GEOG 497 (1-10) Internship**

An applied work and learning experience. The student will provide a written internship report on professional practicum and the work supervisor will be consulted on how much the student has accomplished.

Pre: Consent  
On Demand

**GEOG 499 (1-3) Individual Study**

An assignment that is tailored to individual needs of a student. An arrangement is made that the student works on a project (term paper, readings, mapping, field investigation, GIS, or related topics).

Pre: Consent  
On Demand