Geography

College of Social & Behavioral Sciences
Department of Geography
7 Armstrong Hall • 507-389-2617

Chair: Donald A. Friend

Cecil S. Keen, Ginger Schmid, Jose Javier Lopez, Cynthia A. Miller, Martin D. Mitchell, Forrest Wilkerson, Fei Yuan

Students should contact the Office of the Dean for this college prior to choosing to major in GIS Plant Science BS.

Geography is both a social and natural science which seeks to understand the interactions of people with environment by studying the distributions across space and through time of all cultural and physical phenomena on our earth. Geography is divided into two main parts, human and physical. Human geography is directly concerned with people and their actions including culture and economies, whereas physical geography studies the natural resources and physical processes on or near the earth’s surface. Both human and physical geography are explored together as an integrated whole in regional Geography. Cutting edge geospatial technologies enhance the study of people and environment and provide students with skills highly prized in the work force. The Department of Geography offers a full suite of courses in all areas, human, physical, and regional geography as well as field techniques and geospatial technologies.

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.

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, BS

STANDARD MAJOR OPTION (32 credits)

Required for Major (Core, 14 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>GEOG 101</td>
<td>Introduction to Physical Geography (3)</td>
</tr>
<tr>
<td>GEOG 103</td>
<td>Introductory Cultural Geography (3)</td>
</tr>
<tr>
<td>GEOG 340</td>
<td>United States (3)</td>
</tr>
<tr>
<td>GEOG 370</td>
<td>Cartographic Techniques (4)</td>
</tr>
<tr>
<td>GEOG 401</td>
<td>Colloquium (1)</td>
</tr>
</tbody>
</table>

Required for Major (Electives, 18 credits)

(Choose one cultural-systematic course from the following)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>GEOG 425</td>
<td>Economic Geography (3)</td>
</tr>
<tr>
<td>GEOG 435</td>
<td>Urban Geography (3)</td>
</tr>
<tr>
<td>GEOG 437</td>
<td>Political Geography (3)</td>
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<tr>
<td>GEOG 438</td>
<td>Social Geography (3)</td>
</tr>
</tbody>
</table>

(Choose one physical course from the following)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>GEOG 217</td>
<td>Weather (3) WITH OPTIONAL</td>
</tr>
<tr>
<td>GEOG 218</td>
<td>Weather Lab (1)</td>
</tr>
<tr>
<td>GEOG 313</td>
<td>Natural Disasters (3)</td>
</tr>
</tbody>
</table>

GEOG 315 Geomorphology (3)
GEOG 410 Climatic Environments (3)
GEOG 420 Conservation of Natural Resources (3)
(Choose one foreign regional course from the following)
GEOG 445 Latin America (3)
GEOG 450 Europe (3)
GEOG 454 Russian Realm (3)
GEOG 456 Africa (3)
GEOG 458 Geography of East Asia (3)
(Choose one capstone experience from the following)
GEOG 440 Field Studies (1-4)
GEOG 480 Seminar (1-4)
GEOG 491 Senior Paper (1-4)
GEOG 497 Internship (1-10)
Choose additional electives (above 100 level): GEOG Electives

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

Required Minor. Yes. Any.

PROFESSIONAL MAJOR OPTION

Required for Major (Core, 14 credits)

Same as for Standard Major.

Required for Major (Electives, 18 credits)

Same as for Standard Major.

Required for Major (Additional Electives, 16 credits)

Choose additional electives (above 100 level): GEOG Electives
Other Electives (6 credits may be taken outside department with department permission)

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

Required Minor. None.

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.

Required Core Courses (12 credits)

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>GEOG 373</td>
<td>Introductory GIS (4)</td>
</tr>
<tr>
<td>GEOG 473</td>
<td>Intermediate GIS (4)</td>
</tr>
<tr>
<td>GEOG 474</td>
<td>Introduction to Remote Sensing (4)</td>
</tr>
</tbody>
</table>

Required Elective Courses (Choose any two courses, 6-8 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>GEOG 439</td>
<td>Transportation Geog. (4)</td>
</tr>
<tr>
<td>GEOG 471</td>
<td>Digital Field Mapping with GPS (4)</td>
</tr>
<tr>
<td>GEOG 475</td>
<td>Advanced Remote Sensing (4)</td>
</tr>
<tr>
<td>GEOG 476</td>
<td>Spatial Statistics (3)</td>
</tr>
<tr>
<td>GEOG 478</td>
<td>Spatial Analysis (3)</td>
</tr>
<tr>
<td>GEOG 479</td>
<td>GIS Practicum (4)</td>
</tr>
<tr>
<td>GEOG 480</td>
<td>Seminar: Environmental Hazards (3)</td>
</tr>
</tbody>
</table>

GIS/PLANT SCIENCE BS

The GIS/Plant Science Degree encompasses the intersecting interests of agriculture, Geographic Information Systems (GIS), and Global Positioning Systems technologies along with advanced studies in soils ecology, plant physiology and diseases. The courses are designed to give an applied and advanced theoretical knowledge of these subjects, which are fast becoming critical in sustaining a viable agricultural economy. This program is offered in partnership with Minnesota West Community College. Students should contact the Department of Geography for information regarding admission to this program.
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.
GE-1C, 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 317 (3) Environmental Geology
An introduction to the analysis of spatial data using the concept of geographic information systems (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.
Pre: GEOG 370
Fall, Spring

GEOG 318 (1) Geographic Information Systems
Geographical data analysis, reading, mapping, and computer assisted analysis.
Fall, Spring

GEOG 320 (3) Conservation of Natural Resources
An 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.

GEOG 340 United States (3)
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
Diverse Cultures - Purple
GE-8, GE-10

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
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.

GEOG 343 (3) United States
Overview of geographic work, interests, and research by guest speakers.
Fall

GEOG 344 (3) Introduction to Geographic Information Systems

GEOG 345 (3) United States (3)

GEOG 346 (3) Introduction to Geographic Information Systems

GEOG 347 (3) United States

GEOG 348 (3) Geography of Minnesota

GEOG 349 (3) United States

GEOG 350 (3) United States

GEOG 351 (3) United States

GEOG 352 (3) Geography of Minnesota

GEOG 353 (3) United States

GEOG 354 (3) Geography of Minnesota

GEOG 355 (3) United States

GEOG 356 (3) Geography of Minnesota

GEOG 357 (3) United States

GEOG 358 (3) Geography of Minnesota

GEOG 359 (3) United States

GEOG 360 (3) Geography of Minnesota

GEOG 361 (3) United States

GEOG 362 (3) Geography of Minnesota

GEOG 363 (3) United States

GEOG 364 (3) Geography of Minnesota

GEOG 365 (3) United States

GEOG 366 (3) Geography of Minnesota

GEOG 367 (3) United States

GEOG 368 (3) Geography of Minnesota

GEOG 369 (3) United States

GEOG 370 (3) Cartographic Techniques

GEOG 371 (3) Digital Field Mapping with GPS (4)

GEOG 372 (3) Geographical Data Analysis (4)

GEOG 373 (4) Introduction to Geographic Information Systems

GEOG 374 (3) Cartographic Techniques (4)

GEOG 375 (3) Geomorphology (3)

GEOG 376 (3) Geographical Data Analysis (4)

GEOG 377 (3) Geographical Data Analysis (4)

GEOG 378 (3) Cartographic Techniques (4)

GEOG 379 (3) Geographical Data Analysis (4)

GEOG 380 (3) Cartographic Techniques (4)

GEOG 381 (3) Geographical Data Analysis (4)

GEOG 382 (3) Cartographic Techniques (4)

GEOG 383 (3) Geographical Data Analysis (4)

GEOG 384 (3) Cartographic Techniques (4)

GEOG 385 (3) Geographical Data Analysis (4)

GEOG 386 (3) Cartographic Techniques (4)

GEOG 387 (3) Geographical Data Analysis (4)

GEOG 388 (3) Cartographic Techniques (4)

GEOG 389 (3) Geographical Data Analysis (4)

GEOG 390 (3) Cartographic Techniques (4)
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Description</th>
<th>Meeting Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 409 (1-4) Selected Topics</td>
<td>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.</td>
<td>Fall, Spring</td>
<td></td>
</tr>
<tr>
<td>GEOG 410 (3) Climatic Environments</td>
<td>The characteristics of particular climates and understanding the factors that control their spatial distribution. Pre: GEOG 101, or consent</td>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 412 (4) Advanced Weather</td>
<td>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</td>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 414 (3) Biogeography</td>
<td>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.</td>
<td>Fall</td>
<td></td>
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<tr>
<td>GEOG 420 (3) Conservation of Natural Resources</td>
<td>Survey of natural resources emphasizing energy, minerals, soils, fisheries, and water resources. Also addresses timber, wetlands, and wildlife on public and private lands.</td>
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<tr>
<td>GEOG 425 (3) Economic Geography</td>
<td>Examines national and international economic geographical order and trade activities. Topics include economic development, competition, international trade, and impacts on the environment and people.</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>GEOG 430 (3) Historical Geography of the United States</td>
<td>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.</td>
<td>On Demand</td>
<td></td>
</tr>
<tr>
<td>GEOG 435 (3) Urban Geography</td>
<td>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.</td>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 436 (2) Rural Development</td>
<td>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.</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>GEOG 437 (3) Political Geography</td>
<td>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.</td>
<td>Spring</td>
<td></td>
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<tr>
<td>GEOG 438 (3) Social Geography</td>
<td>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.</td>
<td>Fall</td>
<td></td>
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<tr>
<td>GEOG 439 (4) Transportation Geography</td>
<td>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.</td>
<td>Fall</td>
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<tr>
<td>GEOG 440 (1-4) Field Studies</td>
<td>Various excursions to study physical and cultural landscapes inside and outside of Minnesota.</td>
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<tr>
<td>GEOG 446 (3) Canada</td>
<td>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.</td>
<td>ALT-Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 449 (3) Latin America</td>
<td>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.</td>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>GEOG 450 (3) Europe</td>
<td>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.</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>GEOG 454 (3) Russian Realm</td>
<td>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.</td>
<td>Variable</td>
<td></td>
</tr>
<tr>
<td>GEOG 456 (3) Africa</td>
<td>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.</td>
<td>Variable</td>
<td></td>
</tr>
<tr>
<td>GEOG 458 (3) Geography of East Asia</td>
<td>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.</td>
<td>Variable</td>
<td></td>
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<tr>
<td>GEOG 460 (3) Geography Teaching Methods</td>
<td>The course will cover resource materials and current techniques in classroom teaching.</td>
<td>Variable</td>
<td></td>
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<tr>
<td>GEOG 464 (4) Teaching Earth Science</td>
<td>An applied course tailored to meet practical needs of a teacher, related to curriculum development and earth science lab equipment and supplies.</td>
<td>Variable</td>
<td></td>
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</tbody>
</table>
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) Advanced Remote Sensing
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
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

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