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## GEOGRAPHY

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### **FREN 504 (2-4) French Syntax**

Systematic review of French grammar.  
Prerequisite: undergraduate French major

### **FREN 505 (2-4) Business French I**

Study of current vocabulary, terminology, and practices used in the business world. Study of developments affecting the French business, industrial, and agricultural communities.  
Prerequisite: undergraduate French major

### **FREN 506 (2-4) Business French II**

Study of France's position in the European Economic Community and of the development of French business law with an emphasis on the obligations and rights of business people, the classification and organization of the various types of companies, the emission of contracts, and other documents.  
Prerequisite: undergraduate French major

### **FREN 515 (1-3) Composition**

Practice in descriptive, narrative, and expository writing. Acquisition of vocabulary and advanced grammatical structures.  
Prerequisite: undergraduate French major

### **FREN 516 (1-4) Conversation**

Practice in advanced conversational skills.  
Prerequisite: undergraduate French major

### **FREN 517 (1-3) Modern France**

In-depth study of different aspects of contemporary French civilization.  
Prerequisite: undergraduate French major

### **FREN 520 (1-4) French Seminar**

In-depth study of an author, genre, movement, theme, or period.  
Prerequisite: undergraduate French major

### **FREN 532 (1-4) French Literature I**

Study of the major authors, works, and movements of two successive centuries of French literature.  
Prerequisite: undergraduate French major

### **FREN 542 (1-4) French Literature II**

Study of the major authors, works, and movements of two successive centuries of French literature.  
Prerequisite: undergraduate French major

### **FREN 552 (1-4) French Literature III**

Study of the major authors, works, and movements of two successive centuries of French literature.  
Prerequisite: undergraduate French major

### **FREN 594 (1-6) Supervised Study in French-Speaking Countries**

Topics will vary. Study for credit must be approved by the department prior to departure.  
Prerequisite: undergraduate French major

### **FREN 597 (1-6) Internship**

Prerequisite: undergraduate French major

### **FREN 614 (1-3) Paris Et L'Ile De France**

Visits to the major churches, cathedrals, castles, monuments, museums, and neighborhoods in and around Paris.  
Prerequisite: undergraduate degree in French

### **FREN 660 (2) Research Methods: French**

Methods and tools of literary research.  
Prerequisite: undergraduate degree in French

### **FREN 677 (1-4) Individual Study**

Topics will vary.  
Prerequisite: undergraduate degree in French

### **FREN 680 (1-3) Topics in French Literature**

Topics will vary. May be repeated.  
Prerequisite: undergraduate degree in French

### **FREN 681 (1-3) Topics in French Culture & Civilization**

Topics will vary. May be repeated.  
Prerequisite: undergraduate degree in French

### **FREN 682 (1-3) Topics in French Language Study**

Topics will vary. May be repeated.  
Prerequisite: undergraduate degree in French

### **FREN 693 (1-6) Supervised Study in a French-Speaking Country**

Topics will vary. Study for credit must be approved by the department prior to departure.  
Prerequisite: undergraduate degree in French

### **FREN 694 (1) Alternate Plan Paper**

Prerequisite: undergraduate degree in French

### **FREN 697 (1-6) Internship: Community College Option**

### **FREN 699 (3-6) Thesis**

Prerequisite: undergraduate degree in French

## **MODERN LANGUAGE (MODL)**

### **MODL 560 (3) Methods of Teaching Modern Languages**

Introduction to theory and practice of modern language teaching, including lessons in listening, speaking, reading, writing, vocabulary, and culture. Includes testing, program design, lesson planning, and use of technology.  
Pre: Student must demonstrate oral proficiency level of Intermediate-High on ACTFL, scale in target language.

### **MODL 561 (1) Applied Modern Language Teaching Methods**

A field experience in a secondary school setting for students earning licensure in modern language teaching. Practicum students work with middle or high school students of French, German, or Spanish. Take concurrently with or following MODL 460.

### **MODL 562 (3) Foreign Languages in the Elementary School (FLES) Methods**

Introduction to theory and practice of modern language teaching for children grades K-6, including oral language development, second language literacy development, content-based language instruction, and techniques for language immersion programs.  
Pre: Student must demonstrate oral proficiency level of Intermediate-High on ACTFL, scale in target language.

### **MODL 563 (1) Applied FLES Methods**

A field experience in an elementary setting for students earning licensure in modern language teaching. Practicum students work with elementary school students in French, German, or Spanish. Take concurrently with or following MODL 462.

### **MODL 565 (1-3) Workshop in Modern Language Education**

Topics in modern language education. May be repeated for credit.

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## GEOGRAPHY MS

### **GEOGRAPHY EDUCATION MS**

(DISCIPLINED-BASED)

*College of Social & Behavioral Sciences*

*Department of Geography*

7 Armstrong Hall • 507-389-2617

Chair: Martin Mitchell, Ph.D.

Branko Colakovic, Ph.D.; Donald Friend, Ph.D.; Cecil Keen, Ph.D.; Jiyeong Lee, Ph.D.; Jose Javier Lopez, Ph.D.; Cynthia Miller, Ph.D.; Martin Mitchell, Ph.D.

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Geography, as taught at Minnesota State University, Mankato, deals with phenomena in earth space and their areal extent, intensity and variation. Graduate programs in geography are designed to help students develop advanced skills in research design and analysis, as well as competence in using specific tools of geographic inquiry. In addition, the department provides necessary continuing education for a variety of elementary, high school and post-secondary teachers and other professionals, such as planners.

Geography graduate study emphasizes knowledge and understanding of environments and processes derived from the basic structure of Earth, as well as the cultural attributes and diversity of its peoples. Geography also examines links among economies, cultures and intellectual models that attempt to explain perceptions of Earth, along with the geographer's concepts and strategies for analyzing these interconnections.

In addition to a diverse and experienced faculty, the department supports its own reference collection of books, periodicals and maps. The department maintains a fully equipped cartography laboratory, including computer-assisted cartography software and equipment. The department supports a geographical analysis laboratory in which students have access to GIS software and hardware along with appropriate peripheral equipment. GPS software and equipment are also available. MSU's Weather Analysis Laboratory for Teaching and Educational Resources

(WALTER) is an independent unit equipped with state-of-the-science weather observation and display equipment. Two satellite dishes feed multiple data streams to a console of computers using VISTA, Storm-Sentry and Storm-Pro (from DTN-Kovouras), Satellite imagery (from NVG), data analysis programs like LEADS (from IPS) and the EWB visualization program (from SSESCO). A time-lapse Sky-Cam and local observational instruments complete the total weather picture available. The facility provides one of the best teaching/learning environments in the Midwest. The University library holds many of the major U.S. geographical journals. The library's map and atlas holdings are formally organized in its Map Collection, which is a depository for maps produced by federal government agencies including (but not limited to) the U.S. Geological Survey, the Defense Mapping Agency, and the U.S. Department of Agriculture (including the Forest Service).

**Admission.** Applicants for admission to graduate programs in geography must have maintained a grade point average of 2.75/4.0 for the last two years of undergraduate work for a four-year degree. Applicants having grade point averages below the minimum who present convincing evidence of potential for success in graduate studies may be considered for provisional admission. Letters of recommendation from at least two individuals familiar with the applicant's undergraduate academic performance are required as is a statement of intent by the applicant. Scores from the GRE are not required for admission unless the undergraduate grade point average is below 2.75 for the last two years of work for the baccalaureate degree.

**Financial Assistance.** Several graduate assistantships are available through the Department of Geography. Most are funded directly from the College of Graduate Studies and Research. Typically, assistantships carry an obligation of about ten hours per week. Further information about the availability of assistantships and about the status of applications for assistantships should be sought from the department chair.

## GEOGRAPHY MS

(Thesis Plan - 30 credits)

(Alternate Plan Paper - 34 credits)

### Required Core and Research (6 credits)

GEOG 678 Geographic Research & Writing (3)

GEOG 680 Philosophy of Geography (3)

### Required Electives (24-26 credits)

Choose any 500/600 level elective courses in consultation with an advisor. 15 credits must be taken in Geography.

### Required Thesis or Alternate Plan Paper

GEOG 694 Alternate Plan Paper or Internship (1-2)

GEOG 699 Thesis (3-6)

## GEOGRAPHY EDUCATION MS

(DISCIPLINE-BASED)

(Thesis Plan - 30 credits)

(Alternate Plan Paper - 34 credits)

Teaching licensure is a prerequisite to pursuing this degree which is for teachers interested in enrichment in a teaching area. This degree does not lead to initial teaching licensure. Students who desire initial licensure should consult the Master of Arts in Teaching (MAT) program. Please see the section concerning the MAT program that is listed in this bulletin.

### Required Geography (3 credits)

GEOG 680 Philosophy of Geography (3)

### Required Professional Education (6 credits)

KSP 640 Assessment and Evaluation (3)

KSP 675 Curriculum Appraisal (3)

### Required Education outside Geography and Professional Education (6 credits)

Choose any 500/600 level Education courses taken in disciplines outside Geography and Educational Studies: K-12 and Secondary Programs in consultation with an advisor

### Required Geography Electives (9-11 credits)

Choose any 500/600 level Geography elective courses in consultation with an advisor. A minimum of 6 credits need to be taken in a specialized geography area (e.g. physical geography)

### Required Electives (4-7 credits)

Choose any 500/600 level elective courses in consultation with an advisor

### Required Thesis or Alternate Plan Paper

GEOG 694 Alternate Plan Paper (1-2)

GEOG 699 Thesis (3-6)

## COURSE DESCRIPTIONS

### GEOG 509 (1-3) 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.

### GEOG 510 (3) Climatic Environments

A qualitative regional climatology of the world, including the Pleistocene Ice Ages and urban impacts upon climate. Emphasis is on the characteristics of particular climates and understanding the factors that control their spatial distribution.

Prerequisite: GEOG 101 or con

### GEOG 512 (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.

Prerequisite: GEOG 317

### GEOG 520 (3) Conservation of Natural Resources

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

### GEOG 525 (3) Economic Geography

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

### GEOG 530 (3) Historical Geography: The U.S.

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.

### GEOG 535 (3) Urban Geography

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

### GEOG 536 (2) Rural Development

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 carving out research projects on rural environments.

### GEOG 537 (3) Political Geography

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

### GEOG 540 (1-4) Field Studies

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

### GEOG 545 (3) Latin America

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

### GEOG 546 (3) Canada

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

### GEOG 550 (3) Europe

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

### GEOG 554 (3) Russian Realm

Survey of the area of the former Soviet Union. Examines regional patterns of the physical environment, natural resources, population distribution, cities, and economic activity. Relates people to the land.

### GEOG 556 (3) Africa

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

Prerequisite: Jr. or Sr. status

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## GEOLOGY

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### **GEOG 558 (3) West Pacific Rim**

Examines the ecological and human environments of eastern and southeastern Asia, mainly China, Japan, and off-shore nations. The course will be supported with field information.

### **GEOG 560 (3) Geography Teaching Methods**

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

### **GEOG 564 (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.

### **GEOG 571 (4) Field Mapping with GPS**

This course will cover basic strategies for conducting field surveys and gathering from the real world data appropriate to mapping the earth's surface. Emphasis will be upon simple but reliable techniques, ranging from compass-and-pacing to global positioning systems (GPS).

Prerequisite: GEOG 101, or 470/570

### **GEOG 573 (4) Geographic Information Systems**

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.

Prerequisite: GEOG 373

### **GEOG 576 (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, tables and statistical results.

### **GEOG 577 (1-3) Topics in Techniques**

This offering will include a variety of selected technical topics in geography, including (but not 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.

Prerequisite: permission of instructor

### **GEOG 579 (1-3) 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 a course or professional-level experience.

Prerequisite: GEOG 373, or 473/573, or permission of instructor

### **GEOG 580 (1-3) Seminar**

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

### **GEOG 597 (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.

Prerequisite: permission required

### **GEOG 609 (1-3) Selected Topics**

The instructor will develop a specific course on a geographic topic (land forms, soils, waters, natural resources, cities, agriculture, or any other topic of a geographic nature).

### **GEOG 610 (1-4) Issues in Physical Geography**

Discussion and analysis of contemporary issues in the field of physical geography. Designed to allow in-depth focus on current problems/issues that geographers will encounter in their professional practice. Topics vary according to instructor.

### **GEOG 620 (1-4) Issues in Cultural Geography**

Discussion and analysis of contemporary issues in the field of cultural geography. Designed to allow in-depth focus on current problems/issues that geographers will encounter in their professional practice. Topics vary according to instructor.

### **GEOG 650 (1-4) Issues in Regional Geography**

Discussion and analysis of contemporary issues in the field of regional geography. Designed to allow in-depth focus on current problems/issues that geographers will encounter in their professional practice. Topics vary according to instructor.

### **GEOG 670 (1-4) Issues in Geographic Techniques**

Discussion and analysis of contemporary issues in the field of Geographic Techniques. Designed to allow in-depth focus on current problems/issues that geographers will encounter in their professional practice. Topics vary according to instructor.

### **GEOG 673 (3) GIS for Planners**

To introduce URSI and Park and Rec. graduate students to geographical analysis in urban and regional planning through the use of GIS technology, particularly Arc/Info. Students will be introduced to various urban planning projects taking place in various local agencies. \*This course is not for Geography students.

### **GEOG 677 (1-4) Individual Study**

A study assignment for a student to meet specific objectives for the student's needs. It could be a term paper, readings, reports, field report, or mapping project.

Prerequisite: permission of instructor

### **GEOG 678 (3) Geographic Research & Writing**

Required of MS professional degree candidates. To acquaint students with the geographer's perspective and methods of inquiry; to examine types of geographic research; to develop student's ability in producing research papers; to give students experience in writing research papers and to provide students experience in professional oral presentation.

### **GEOG 680 (3) Philosophy of Geography**

The history and development of geographic thought from ancient times to the late 20th century.

### **GEOG 681 (3) Environmental Issues**

This course surveys various environmental issues within the United States with an emphasis on state and federal legislation and policies. The forces prompting environmental legislation, its subsequent implementation and modification by the courts, and various perspectives about the problems, their possible solutions, and the assessment of current efforts are discussed.

### **GEOG 690 (1-4) Topics in Meteorology/Climatology**

The focus of this/these course(s) will be on Meteorology/Climatology. This course may be repeated up to three times.

### **GEOG 694 (1-2) Alternate Plan Paper**

Student culminating experience in lieu of a thesis.

### **GEOG 698 (1-6) Internship**

An applied work and learning practicum. The student will provide a written report on his/her own learning. The work supervisor will be consulted regarding students' accomplishments.

### **GEOG 699 (1-6) Thesis**

A culminating project related to basic or applied research

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## GEOLOGY

*College of Science, Engineering & Technology*

*Department of Chemistry and Geology*

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Geology is the science of the earth. It concerns itself with the materials that constitute the earth, their disposition and structure; the processes of work both on and within the earth; and both the physical and biological history of the earth.

The following graduate courses are offered and may be used to supplement existing graduate programs or may be part of a multidisciplinary studies program.

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### COURSE DESCRIPTIONS

#### **GEOL 501 (1-3) Field Studies**

This course is devoted to the study and practice of geological field investigations. Students will first learn basic field investigative methods. Students will then be appropriately versed in the geological history and importance of a region selected for in-depth study. Finally, students will participate in a field trip to a regional site of geological importance over an extended weekend (4-6 days). Potential study sites may include Minnesota's North Shore and Iron Range, the Badlands and Black Hills of South Dakota, the Ozarks, or the Rocky Mountains.

Prerequisite: GEOL 100 or 121 or 122 V

#### **GEOL 550 (3) Hydrogeology**

This course introduces physical and chemical studies of hydrogeology. The main area of discussion will include the physical and chemical attributes of aquifers, movement of groundwater and solute through soils and rocks, and reactions between earth materials and pollutants in groundwater systems. The class includes extensive use of MODFLOW and MT3D, the two most commonly used groundwater modeling programs currently available.

#### **GEOL 590 (1-4) Workshop**