

# Handbook of Graduate Studies

*Master of Science in Geography*

*Master of Science in Geographic Information Science*

*Geographic Information Science Graduate Certificate*



MINNESOTA STATE  
UNIVERSITY  
MANKATO

**Department of Geography**  
**Minnesota State University, Mankato**

**The purpose of this handbook is to provide information about:**

- 1. the Department of Geography at Minnesota State University, Mankato; and**
- 2. policies, guidelines, and procedures relevant to students pursuing a Master of Science in Geography (MS Geography), Master of Science in Geographic Information Science (MS GISc), or a Geographic Information Science Graduate Certificate (GIS-GC).**

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## Chapter 1. Department of Geography Profile

Geography has been in the curriculum at Minnesota State University, Mankato since its founding as a Normal School in 1867. Today, the Department of Geography offers a variety of undergraduate and graduate degrees and certificates, with a range of courses, field and laboratory experiences, and internship opportunities. The Department houses the Cartography, GIS, and Weather Labs and is affiliated with the EARTH Systems Lab. Geography graduate students gain hands-on experience with cutting-edge tools, techniques, and software to examine contemporary issues, making our graduates well-prepared for a career or continued study in earth, environmental, community, and geospatial fields.

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**Website:** <https://sbs.mnsu.edu/academics/geography>

**Department Chair:** Dr. Martin Mitchell (Armstrong Hall 212E; [martin.mitchell@mnsu.edu](mailto:martin.mitchell@mnsu.edu); 507-389-1610)

**Graduate Coordinators:**

- MS Geography: Dr. Mark Bowen (Morris Hall 222L; [mark.bowen@mnsu.edu](mailto:mark.bowen@mnsu.edu); 507-389-5187)
- MS GISc and GIS-GC: Dr. Fei Yuan (Armstrong Hall 212J; [fei.yuan@mnsu.edu](mailto:fei.yuan@mnsu.edu); 507-389-2376)

**Administrative Assistant:** Katrina Schwartz (Morris Hall 206; [katrina.meyer@mnsu.edu](mailto:katrina.meyer@mnsu.edu); 507-389-2616)

**Academic Programs**

- Geography
- Earth Science
- Geographic Information Science

**Academic Degrees**

- Undergraduate Degrees
  - Geography BS and BA
  - Geography Minor
  - Earth Science BS
  - Earth Science Minor
  - Geomorphology and Earth Surface Processes Certificate
  - Earth Science Teaching (5-12) BS
  - Geographic Information Science (GIS) Certificate
- Graduate Degrees
  - Geography MS
  - Geographic Information Science MS
  - Geographic Information Science Graduate Certificate

### Department Members

- 1 Administrative Assistant/Office Manager
- 10 Faculty Members
  - 5 Professors
    - 2 Distinguished Professors
    - 3 Distinguished Faculty Scholars
  - 5 Associate Professors
- ~6-12 Graduate Teaching/Research Assistants

### Faculty Teaching and Research Interests

Faculty interests and courses generally fit within the following concentrations: 1) Conservation and Natural Resource Management; 2) Soils, Landscapes, Weather, and Environments; 3) GIS, Remote Sensing, Spatial Analysis, GPS Field Mapping, and Transportation; 4) Cultural and Regional Studies; and 5) People, Communities, and Health. Regional emphases include the southwestern USA, High Plains USA, upper Midwest USA, west coast of the USA, Latin America, Caribbean, Scandinavia/Iceland, central Europe, East Asia, India, China, Taiwan, and Canada.

- Sudarshana Bordoloi (Associate Professor) - Public Health/Health Geographies, Population Geography, Migration Geography, Human Geography. International Development Studies and Globalization
- Mark Bowen (Associate Professor; EARTH Systems Lab Co-Director) - Soils, Geomorphology, Quaternary Environmental Change, Agricultural Landscapes, The Anthropocene
- Donald Friend (Professor) - Mountain Geography, Physical Geography, Environment and Development, Climate Change
- Woo Jang (Associate Professor) - Geographic Information Systems, Transportation Geography, Geospatial Technologies, Global Positioning Systems
- Jose Javier Lopez (Professor) - Social and Economic Geography, Latin America, Quantitative Methods and Spatial Analysis with GIS
- Phillip Larson (Professor; Earth Science Programs Director) - Fluvial geomorphology and drainage basin evolution, transverse drainage processes, landscape evolution and paleoenvironmental/paleogeographic change, arid/desert geomorphology, aeolian geomorphology, granitic and volcanic landscapes, natural hazards/disasters
- Cynthia Miller (Associate Professor) - Historical Geography, Environmental Geography, Environmental Hazards
- Martin Mitchell (Professor) - Cartographic Theory, Historical Geographies, The American West, Physical Geography, Natural Resources
- Rama Mohapatra (Associate Professor) - Geographic Information Systems, Urban Geography, Geospatial Technologies
- Fei Yuan (Professor) - Remote Sensing, Geospatial Technologies, GIS in Natural Resource Management, Precision Agriculture, East Asia

## Department Facilities

- Geography Office (Morris Hall 206)
  - Central office for Administrative Assistant and front desk
  - Conference room
  - Reception seating area
  - Computer workstations and student work area
  - Faculty office
- Laboratories
  - Cartography Laboratory (Armstrong Hall 223A)
    - ~12 computer workstations
    - Multiple printers
    - Conference table
    - Large format HD TV
    - White board
  - EARTH Systems Laboratory (Carkoski Commons 150)
    - 3 computer workstations
    - Teaching space
      - Large format HD TV
      - White boards
      - Conference table and individual tables
    - Research space
      - 4 sinks
      - Extensive table space
      - Standard laboratory supplies (beakers, graduated cylinders, scales, etc.)
      - Variety of analytical and field equipment (soil core processing, sediment analysis, ground penetrating radar, UAVs, drones, augers and corers, GNSS units, total stations, etc.)
  - Geographic Information Systems Laboratory (Morris Hall 212)
    - ~28 computer workstations
    - Multiple printers
    - Large format plotter
    - Teaching workstation and projector
    - White boards
  - Weather Laboratory (Armstrong Hall 14)
    - ~15 computer workstations
    - Conference table
    - 2 Large format HD TVs
    - White board
    - Extensive map collection
    - Graduate student offices

## Chapter 2. Program Descriptions

The Department offers two Master of Science (MS) degrees, one in Geography and one in Geographic Information Science (GISc). Both degrees are flexible, and concentrations can be tailored to suit the student's needs or interests. Graduate students in the MS Geography program can pursue the thesis or Alternate Plan Paper (APP) option, while students in the MS GISc program have the thesis, APP, and course-only options. The course-only and APP options are considered terminal degrees geared towards career preparation, while the thesis option allows students the opportunity to continue graduate studies at the Ph.D. level. The Department also offers a graduate certificate in GISc.

### MS Geography Program Description

Geography studies the natural and anthropogenic systems, interactions between people and our environment, and utilizes cutting-edge geospatial technologies to solve problems.

#### Program Highlights

- Students will gain expertise in natural and/or human systems that can be applied to solving real-world problems.
- Students will gain experience in quantitative and qualitative field and laboratory methods.
- Students can gain expertise in geospatial technologies (GIS, GPS, Remote Sensing, Spatial Analysis) used to address contemporary issues.
- Students are trained to be successful in public and private sectors or continue to a Ph.D.
- Students will learn to conduct scientific inquiry and will gain experience in communicating scientific results/data to the public.

#### Application Requirements

- Bachelor's degree from an accredited university with a minimum GPA of 3.3
- Personal statement
- Resume
- It is recommended that you inquire with potential advisors in the department prior to applying
- It is also recommended that you detail in your personal statement who your potential advisor might be and describe your research interests and how it aligns with your potential advisor
- Three letters of recommendation with at least one from an individual acquainted with your academic ability

#### Additional Requirements for International Applicants:

- Minimum TOEFL iBT score of 75 or a minimum IELTS score of 6.0
- Credential Evaluation prepared by a National Association of Credentials Evaluation Service member

**Curriculum Requirements**

- Thesis Option: 30 credits minimum
  - Thesis capstone required
  - A thesis results in original research through the gathering, processing, and analysis of data and by building and testing theories.
- Alternative Plan Paper (APP) Option: 34 credits minimum
  - APP capstone required
  - An APP critically reviews and evaluates secondary research sources for the development of a thorough, extensive, and academic orientation to a problem. The evaluation and analysis of the research must provide sufficient background for the student to draw and summarize sound conclusions, highlight strengths and weaknesses of the data, develop alternative resolutions to the research problem, and identify directions for future research.
  - The APP option is considered a terminal degree, and most Ph.D. granting institutions do not accept students into their programs unless they have completed the thesis option.

**Common Core**

- GEOG 680 – Philosophy of Geography (3 credits; Spring semester)

**Research/Methods Course**

- GEOG 678 – Geographic Research and Writing (3 credits; Fall semester)

**Restricted Electives**

- Choose any 500/600-level elective courses in consultation with an advisor (classes at the 400-level or lower cannot be counted towards your degree)
  - You need at least 18 (Thesis) to 26 (APP) elective credits
  - At least 9 (Thesis) to 13 (APP) elective credits must be taken in Geography
  - At least 6 (Thesis) to 10 (APP) elective credits must be at the 600 level

**Capstone Course**

Select either Thesis or APP

- GEOG 694 – Alternate Plan Paper (1-2 credits)
- GEOG 699 – Thesis (1-6 credits)

## **MS GISc Program Description**

The MS GISc program integrates the geospatial technologies of geographic information systems (GIS), remote sensing, and global positioning systems (GPS) with the professional skills of technical communications, project management, human resource management, and budgeting and economics in the workplace. These combine to create tools to implement real-world solutions to critical problems.

The program offers comprehensive courses on GIS, remote sensing, GPS, spatial analysis, geospatial modeling and simulation, geodatabase, programming, web mapping, transportation analysis, and more. The thesis, APP, and course-only options will allow students to complete their degrees in a flexible way.

### **Program Highlights**

- The MS GISc program is designed to meet the needs of working professionals as well as to provide an educational option for students who are seeking a higher degree in GIS.
- Courses taught by subject matter experts and professionals in their fields.
- Applied focus that integrates courses in information technology, business, urban and regional studies, and GIS.

### **Application Requirements**

- Bachelor's degree from an accredited university with a minimum GPA of 3.0.
- Personal statement
- Resume
- Highly recommend completing at least two GIS courses (minimum GPA of 3.0) prior to applying.
- Three letters of recommendation with at least one from an individual acquainted with your academic ability.

### **Additional Requirements for International Applicants:**

- Minimum TOEFL iBT score of 75 or a minimum IELTS score of 6.0
- Credential Evaluation prepared by a National Association of Credentials Evaluation Service member.



**Curriculum Requirements**

- Thesis Option: 32 credits minimum
- Alternative Plan Paper (APP) Option\*: 34 credits minimum,
- Coursework-Only Option\*: 36 Credits minimum.

*\*APP and Coursework-Only options are considered terminal degrees, and most Ph.D. granting institutions do not accept students unless they have completed the thesis option.*

**Common Core (Required)**

- GEOG 671 – Geodatabase (3 credits; Fall)
- GEOG 672 – Geospatial Modeling and Simulation (3 credits; Fall)
- GEOG 673 – Advanced GIS (3 credits; Spring)
- GEOG 674 – Advanced Remote Sensing (3 credits; Spring)

**Research/Methods Course (Required)**

- GEOG 670 Seminar in GIS (3 credits; Fall)

**Capstone Course (Required)**

Choose one from the following courses.

- GEOG 679 GIS Practicum (3 credits; Spring)
  - for Coursework-Only option
- GEOG 694 Alternate Plan Paper (1-2 credits; Fall, Spring, and Summer)
  - for Alternate Plan Paper option students who plan to complete a research project based on their coursework or internship
- GEOG 699 Thesis (1-6 credits; Fall, Spring, & Summer)
  - Required for Thesis option students who may plan to continue in a doctoral program.

**Restricted Electives**

Choose 12 – 18 Credit(s) from the following courses:

- GEOG 539 Transportation Modeling & GIS (4 credits; Spring)
- GEOG 571 Digital Field Mapping with GPS (4 credits; Fall)
- GEOG 573 Intermediate GIS (4 credits; Fall & Spring)
- GEOG 574 Introduction to Remote Sensing (4 credits; Fall and Spring)
- GEOG 575 Open-Source GIS (4 credits; Spring)
- GEOG 576 Spatial Statistics (3 credits; Fall)
- GEOG 578 Spatial Analysis with GIS (3 credits; Spring)
- GEOG 579 GIS Practicum (1-4 credits; Spring)
- GEOG 581 GIS and Environmental Hazards (3 credits; Fall and Spring)
- GEOG 582 GIS for Natural Resources (4 credits; Spring)
- GEOG 583 Cloud Mapping & Visualization (4 credits; Fall)
- GEOG 584 Web GIS (4 credits; Fall)
- GEOG 585 GIS Programming (4 credits; Spring)

**Unrestricted Electives**

Choose 1 – 6 Credit(s) from the following courses:

- GEOG 610 Issues in Physical Geography (1-4 credits; On demand)
- GEOG 620 Issues in Cultural Geography (1-4 credits; On demand)
- GEOG 650 Issues in Regional Geography (1-4 credits; On demand)
- GEOG 677 Individual Study (1-4 credits; Fall, Spring, and Summer)
- GEOG 678 Geographic Research & Writing (3 credits; Fall)
- GEOG 680 Philosophy of Geography (3 credits; Spring)
- GEOG 681 Environmental Issues (3 credits; Spring)
- GEOG 698 Internship (1-6 credits; Fall, Spring, and Summer)

Course Outside Geography: Choose 0 – 4 Credit(s):

- One 500/600-level course (up to 4 credits) from relevant program outside of Geography may be used toward unrestricted electives as approved by the advisor.

***Please note: Restricted Electives, Unrestricted Electives, and Capstone Course credits must add up to a minimum of 17 credits for the Thesis option, 19 credits for the APP option, or 21 credits for the Coursework-only option.***

## **Geographic Information Science Graduate Certificate Description**

The goal of the Geographic Information Science Certificate program (GIS-GC) is to educate students in remote sensing, geographic information system (GIS), global positioning system (GPS), geovisualization, geoanalytics, geospatial modeling, and various associated sciences. The program provides students the skills necessary to investigate spatio-temporal patterns that result from human-environmental interactions. It is designed for students who want to acquire or advance their knowledge in the field of geospatial sciences, and for professionals who need these skills for their current careers.

The primary objective of the certificate program is to provide necessary exposure to geospatial data, concepts, methods, tools, models, and programming knowledge so that students can evaluate geospatial issues and construct appropriate plans of action. The certificate provides background and training to enable students to enter careers in the public or private sectors, and to prepare them for higher study in geospatial sciences.

The courses in the GISc certificate introduce the main concepts and basic principles of geographic information systems and their use in spatial analysis and, information management.

### **Common Core**

- GEOG 573 Intermediate GIS (4 credits; Fall and Spring)
- GEOG 574 Introduction to Remote Sensing (4 credits; Fall and Spring)
- GEOG 670 Seminar in GIS (3 credits; Fall)

### **Restricted Electives**

*Choose 7 credits*

- GEOG 539 Transportation Modeling & GIS (4 credits; Spring)
- GEOG 571 Digital Field Mapping with GPS (4 credits; Fall)
- GEOG 575 Open-Source GIS (4 credits; Spring)
- GEOG 576 Spatial Statistics (3 credits; Fall)
- GEOG 578 Spatial Analysis with GIS (3 credits; Spring)
- GEOG 579 GIS Practicum (1-4 credits; Spring)
- GEOG 581 GIS and Environmental Hazards (3 credits; Fall and Spring)
- GEOG 582 GIS for Natural Resources (4 credits; Spring)
- GEOG 583 Cloud Mapping & Visualization (4 credits; Fall)
- GEOG 584 Web GIS (4 credits; Fall)
- GEOG 585 GIS Programming (4 credits; Spring)

## Chapter 3. Program Requirements and Guidelines

### Major Advisor and Examination Committee

Before being accepted to one of the graduate programs in the Department of Geography, you should communicate with a potential advisor to make sure they are willing to serve as your major advisor (*this is not required for the course-only option of the MS GISc program*). Students who fail to get permission to work with an advisor may not be admitted to the program. Your major advisor will help you establish an examination committee; select courses; develop a research proposal (if Thesis or APP option); plan and conduct research (if Thesis or APP option); advocate on your behalf for assistantships, scholarships, and field studies/research awards; administer and supervise your comprehensive exams; and generally serve as your first point of contact for nearly everything related to your graduate studies. Thus, it is important to maintain regular contact with your major advisor and meet with them multiple times per semester.

1. The major advisor must be a member of the graduate faculty at the Regular or Research Status.
2. All students writing a thesis must form an examination committee; an examination committee is optional for students pursuing the APP option.
  - a. The examination committee supervises the student throughout their program and completion of their thesis or APP report(s).
  - b. Your examination committee will review your thesis or APP proposal, thesis or APP report(s), provide questions and evaluate your written comprehensive exam, and evaluate and provide feedback on your final oral examination.
  - c. A student's examination committee must have a minimum of two members.
  - d. All members of the examination committee must hold Graduate Faculty status at Minnesota State University, Mankato.
  - e. The Chair of the Committee must be the student's major advisor and ranked as a 'Regular' or 'Research' member of the Graduate Faculty in the student's area of concentration.
  - f. Faculty from other institutions may serve, uncompensated, as members of a student's examining committee.
    - i. Faculty from other institutions must be approved by the student's major advisor and become members of the Graduate Faculty at the "Visiting and Collaborative Faculty" rank.
  - g. Alternative/additional members of the oral examination committee must be approved by the major advisor and the student.

For any reason, you may change your major advisor or examining committee members by completing the Change of Advisor/Committee Member form

- <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/change-of-advisor.pdf>

## Coursework and Plan of Study

Taking classes is an integral part of your graduate experience and training. In addition to gaining new knowledge, your coursework will also help you develop research skills, analytical techniques, and improve your writing and presentation skills.

A Plan of Study form must be filed with the Geography Office before the completion of 16 graduate credits at Minnesota State University, Mankato (*typically before the end of your second semester*). The Plan of Study identifies the major advisor and indicates your degree program, department, course numbers, course titles, total credit hours, and Thesis, APP, or Course-Only option. The Plan of Study must be signed by the student, major advisor and two examining committee members. You should work closely with your major advisor as you fill out the Plan of Study to ensure that you are satisfying all the degree requirements and to create an academic plan for the duration of your time in the graduate program.

- <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/plan-of-study.pdf>

### *Important information to consider about coursework in your graduate degree program:*

- Any deficiencies satisfied by taking undergraduate courses (i.e., courses at the 400-level or lower) should be completed as early in your program as possible and cannot be included on your *Plan of Study* nor count toward graduation.
- Only graduate-level courses (500 level and above) will be counted toward a graduate degree or graduate certificate.
- All master's degree programs must have at least one-half of the credits counted for the degree (excluding thesis and APP credits) earned in courses restricted to graduate students (600 – 699 level).
- A maximum of 6 credits of independent/individual study may be applied toward a graduate degree program or certificate.
- A 3.0 grade point average minimum must be maintained for all graduate work being counted toward the fulfillment of a graduate certificate or degree program.
- Courses taken at Minnesota State University, Mankato that are assigned a 'C-' or below will not be counted for graduation credit. Transfer credits assigned a 'B-' or below will not be accepted.
- If a dual numbered course is taken at the undergraduate level, it cannot be taken at the graduate-level and counted toward a graduate degree program or graduate certificate.
- Graduate courses may be repeated but credit for the course is applicable toward the degree only once. However, all grades earned for that course shall be used in calculating the grade point average.
- To be considered full-time, graduate students must be enrolled for a minimum of 6 graduate-level credits per semester.
- The maximum course load is 12 graduate-level credits each semester.
  - Students who wish to take more than the maximum course load must complete and submit an Overload Request Form.
- At least half of your elective credits included on the *Plan of Study* must be taken in Geography.

- In instances where it suits the student's research needs, more than half of your elective credits may be taken in other departments. Written permission from your major advisor and department graduate coordinator is required.
- All graduate students must satisfy a *Tools of Research Requirement*. To satisfy this requirement, all MS Geography students must successfully complete GEOG 678 – Geographic Research and Writing, and all MS GISc students must successfully complete GEOG 670 – Seminar in GIS.
- Per University requirements, a maximum of 10 graduate credits may be transferred from non-MinnState institutions and up to 16 graduate credits may be transferred from other MinnState schools.

## Thesis

A thesis is an extensive original research paper resulting in a significant contribution to new knowledge. The thesis or dissertation must demonstrate the following abilities:

- Conceive and develop an original research problem
- Theoretically express the research problem
- Develop alternative methods for testing logically generated hypotheses
- Gather, compile, and analyze data using geospatial, mathematical, and/or statistical methods
- Demonstrate rational decisions regarding the resolution of the research problem
- Ability to make recommendations for future research
- Conform to Format and Style Guidelines of the Office of Graduate Studies

Your major advisor and examination committee will play a significant role in helping you develop a research problem and carry it through to completion. Under the thesis plan, the student earns a minimum of 30 credits (MS Geography) or 32 credits (MS GISc) approved on the *Plan of Study*: typically, the student completes 24/26 credits of course work and 6 Thesis credits.

Students writing a thesis must remain within these credit limits:

- A minimum of 3 thesis credits must be earned by a student following a thesis plan.
- A maximum of 6 thesis credits can be applied toward a graduate program.

At the latest, your defended and final draft thesis is due to the Office of Graduate Studies approximately four weeks prior to graduation.

Your major advisor should be able to provide you with examples of previous student theses to help you understand the scope and general framework for your thesis. You should review the Graduate Studies Thesis Format and Style Guidelines website for specific guidelines:

<https://grad.mnsu.edu/capstones/formatting-and-style-guidelines/>

## **Alternate Plan Paper (APP)**

An APP critically reviews and evaluates secondary research sources for the development of a thorough, extensive, and academic orientation to a problem. The evaluation and analysis of the research must provide sufficient background for the student to draw and summarize sound conclusions, highlight strengths and weaknesses of the data, develop alternative resolutions to the research problem, and identify directions for future research.

Under the Alternate Plan Paper (APP) option, the student earns a minimum of 34 credits in approved courses and completes a significant secondary research paper as required by the examining committee. Typically, students take 32 credits of course work and 2 credits of APP. In consultation with your major advisor and with approval from your examining committee, an internship report may be used as the APP. The APP includes a research requirement less extensive in nature than a thesis but should be significantly greater in quality and quantity than the standard graduate term paper.

The same standards of excellence as well as the same formatting and style guidelines for that of a thesis apply to the APP. For information on APP requirements, visit:

<https://grad.mnsu.edu/capstones/alternate-plan-paper-and-other-capstones/>

## **Thesis or Alternate Plan Paper Proposal Defense**

Your major advisor may require a proposal defense. You should inquire with your advisor to see if they require this. If required, this will likely occur near the end of your first year in the program. Your major advisor can also explain the process and expectations of a proposal defense.

A thesis or APP proposal defense should occur prior to data collection, but this may not always be feasible. The proposal should include a tentative title, problem statement, objectives, study area, methodology, timeline, budget, significance of research, and expected outcomes.

Research that involves human or animal participation or subjects requires review by the *Institutional Review Board (IRB)*, which can be a long and tedious process. If your project will require IRB approval, begin this process as soon as possible to reduce delays in your research.

Ideally, you should plan to defend your proposal to your examination committee during your second semester. The proposal may be defended and approved no later than 15 weeks prior to graduation. In consultation with your advisor, enroll for three to six thesis credits or one to two APP credits after the proposal is approved.

## Comprehensive Examinations

Comprehensive examinations are designed to determine the student's broad understanding in the field of study, specific areas of interest, and/or the nature and design of the capstone project. Students in the MS Geography program take a written comprehensive examination AND an oral comprehensive examination. Students in the MS GISc program are required to complete either a written OR an oral comprehensive exam or a capstone project/professional conference presentation.

### Written Comprehensive Examination (MS Geography)

The written comprehensive exam is typically an essay-style exam that covers program coursework, designated reading materials, and/or capstone projects.

- a. Written comprehensive examinations are scheduled, written, administered, and graded by the department.
- b. At least two weeks prior to the scheduled written comprehensive examination date, the student must submit a *Written Comprehensive Examination Request and Report* signed by their major advisor to the Geography Office.
- c. The written comprehensive exam is typically taken towards the end of the student's third semester or beginning of the fourth semester.
- d. The exam typically consists of 3-4 questions and involves about six hours of writing.
- e. Questions are invited from all members of the student's examination committee and may be invited from any professor from whom the student has taken courses. The major advisor selects questions in consultation with the examination committee.
- f. Reference materials may be permitted at the discretion of the major advisor.
- g. The written examination is graded as "pass", "fail", or "decision deferred" by the examination committee.
  - i. If the examination is considered "fail", it may be retaken once.
    - i. Failure to pass the written comprehensive exam a second time will result in dismissal from the program.
  - ii. If the examination is considered "decision deferred", the student may have to expand upon or provide follow-up information to address specific concerns, or the exam may have to be re-taken.

### Oral Examination (MS Geography)

An oral examination (i.e., thesis or APP "defense") is a public presentation of the student's research and is completed after the examination committee has approved a draft of the thesis or APP report(s).

- a. The oral exam must occur at least one month prior to the end of the student's final semester.
- b. The student must petition to take the oral exam at least two weeks in advance of anticipated exam date
- c. A final draft of the thesis/APP reports(s) must be provided to the committee and the Geography Office at least two weeks prior to the oral exam.
- d. The oral exam is a presentation given by the student that focuses on the objectives, methods, and outcomes of the thesis/APP research.



- e. The student is evaluated by the examination committee based on quality and clarity of the presentation; quality, rigor, and appropriateness of the research approach; results and data analysis; and significance/implications of the project.
- f. The examining committee determines whether the student has passed or failed the oral examination. The vote is conducted with only the committee members present and must be unanimous.
  - i. If the examination is not passed, it may be retaken once.
  - ii. Failure to pass the oral exam a second time will result in dismissal from the program.
- g. The major advisor serves as chairperson of the oral examination committee, and, as such, will lead the examination and invite questions from the audience at his/her discretion.
- h. The oral examination is typically public and open to everyone. Under special circumstances (e.g., health issues, privacy issues, sensitive topic/data sources), the oral examination may be closed to the public and open only to committee members and faculty members in the Department of Geography. For a closed oral examination, you must have written permission from all your committee members and Department of Geography graduate coordinator.

### **Comprehensive Examinations (MS GISc)**

MS GISc students are required to complete either a written or oral comprehensive exam or a capstone project/professional conference presentation before degree completion in consultation with your major advisor. Comprehensive examinations are designed to determine the student's broad understanding in the field of study, specific areas of interest and/or the nature and design of the GIS project.

Every student in the MS GISc program must complete a comprehensive examination or equivalent activity in the following format:

- (1) For thesis and APP options, an oral comprehensive examination in the form of a thesis or APP defense is required.
- (2) For the course-only option, students can choose to do a written or an oral comprehensive exam or present a capstone project in a GIS class or at a professional conference.
  - a. Publication of a research manuscript in a peer-reviewed journal can be accepted as a written comprehensive exam.
  - b. If a student is presenting at a professional conference, faculty from the department will evaluate the student's performance.

## Chapter 4. Assistantships, Scholarships, and Internships

### Graduate Assistantships

Graduate Assistantships (GAs) help defray the costs of graduate studies by providing a tuition waiver and stipend. GAs also broaden the graduate student experience by offering additional opportunities such as teaching, curriculum design, administrative support, and assisting research. The Department of Geography typically offers 6-12 GAs per academic year. Assistantship duties in Geography typically involve assisting a professor with research or teaching the laboratory component of a course but could include other professional duties. Many of our students find assistantships outside of the department, and those duties vary.

A full graduate assistantship provides a waiver of up to nine graduate credits per semester (18 graduate credits per academic year) and ~\$5,000 stipend per semester (~\$10,000 per academic year). Students that receive a GA must enroll in a minimum of six credits per semester. Students that receive a GA over the summer term must enroll in a minimum of one graduate credit. Tuition waiver credits can be transferred from one semester to another within the same academic year (they do not carry over from year to year), but you must receive permission at the beginning of that academic year to do so (e.g., a student could receive a ten-credit tuition waiver in fall, seven-credit tuition waiver in spring, and a one-credit tuition waiver in summer).

To be considered for an assistantship, you must complete a Graduate Assistantship Application. This application is available in the Geography Office and should be submitted by February to be considered for a GA the following academic year. For a list of assistantships available outside of Geography\*, visit: <https://admin.mnsu.edu/human-resources/career-opportunities/graduate-assistant-opportunities/>

*\*Application requirements may differ for positions outside of the Department of Geography.*

Assistantships are highly competitive and are typically assigned in March or April for the following academic year. Before the start of each semester, department faculty assign graduate assistants to specific jobs and assign each student a GA supervisor (i.e., the person they will be working for). If you have particular skills or knowledge you would like to employ on an assistantship, or would like to work for a particular professor, communicate this to your major advisor and the graduate coordinator as soon as possible.

The first scheduled workday, or official "duty day", for GAs is the same as faculty members. This is usually about one week in advance of the first day of classes and continues to the first Monday following finals week. The duty day calendar is available at:

[https://admin.mnsu.edu/globalassets/academic-affairs/forms/21-22\\_faculty\\_calendar.pdf](https://admin.mnsu.edu/globalassets/academic-affairs/forms/21-22_faculty_calendar.pdf)

You should contact your GA supervisor as soon as possible once you have been given your assignment, or report to the department graduate coordinator if you have not been assigned a GA supervisor. You should work with your GA supervisor to outline expectations and assignments for the semester. If you receive a full GA, you are expected to work 20 hours per

week on your GA assignment. **At no point should you work more than 20 hours per week** – contact the department chair or a graduate coordinator immediately if your GA supervisor assigns you more than 20 hours of work per week. If you must miss time for any reason (professional or personal), you need to request permission from your GA supervisor as far in advance as possible. Your GA supervisor is not required to accommodate this request, but they may allow you to make up missed work in subsequent weeks.

## Scholarships and Field Studies/Research Awards

Several scholarships and field studies/research awards are available to graduate students. Scholarships are financial awards to help defray the costs of your education and are typically provided directly to the student after deducting for any outstanding fees. Field studies/research awards support student research (e.g., travel, supplies, external lab fees, software, datasets, etc.) and cost of living expenses. Field studies/research award funds may either be provided to the student for direct costs (i.e., expenses incurred by the student) or to the department for department support costs (i.e., expenses paid for by the department).

You can find information on scholarship and field study opportunities here:

<https://sbs.mnsu.edu/academics/geography/scholarships-and-financial-assistance/>

You can apply for these opportunities here: <https://mnsu.academicworks.com/>

Before you submit an application, you should consult with your major advisor. Faculty in the Department of Geography will convene in the spring semester to assign awards based on the quality, need presented, and merit of each proposal/application. Your major advisor will advocate on your behalf, so it is important that you discuss your application with them.

If you are applying for a scholarship, make sure you follow the guidelines and requirements listed in the Scholarship Finder application page. If you are applying for a field studies/research award, make sure you develop your proposal in consultation with your major advisor. Your proposal must include: 1) a narrative that describes your project, states the importance of the project, explains the methodology, and lists a timeline; and 2) a detailed budget describing exactly how funds will be utilized.

In the budget, clearly designate what costs you will personally pay for, and label these as **direct costs**. Direct costs may include personal vehicle mileage, per diem (i.e., daily meal expense per university established costs), and individual room/lodging/camping. Your budget should also clearly designate what costs the department will pay for and label these as **department support costs**. Department support costs are paid for by the department and reimbursed from the foundation account that grants your award. Work with your major advisor to determine which expenses are direct costs and which are department support costs – this must be included in your budget. You and your advisor should keep all receipts and maintain a budget to keep track of all expenses in field studies/research awards. You will need to provide receipts for all expenses to the Geography Office to be reimbursed.

## Internships

If you are interested in a career outside academia, you may find that your most suitable terminal activity is an internship. The objective of the internship program is to provide the student with practical experience in a relevant public agency or private business.

### Internship Guidelines

1. You need a faculty member (typically your major advisor) to serve as your internship advisor.
2. You should begin working with your internship advisor at least one month in advance of your planned internship start date.
3. Prepare a vita or resume that summarizes your academic work and relevant experience (include names of references and examples of papers or projects)
4. Either you or the advisor may establish the contact with the supervising agency.
5. The internship duration can range from three months for a summer internship up to six months for a semester-long internship.
6. A maximum of 10 credits of internship can be counted toward the degree. No more than 6 credits are allowed per semester. One credit is granted per forty-five hours of internship work. You will receive a grade of In-Progress until you have completed the internship.
7. Specific requirements for an internship are available in the *Department of Geography Student Interns: Guidelines for Sponsoring Agencies* available in the Geography Office.
8. Before you begin an internship, you must complete the *Internship Checklist* form and submit it to the Geography Office.
9. Before finishing your internship, the “Intern Performance Evaluation Report” needs to be completed by internship supervisor and turned in to your internship advisor.
10. Submit monthly progress reports to your internship supervisor.
11. In consultation with your major advisor, and with approval of your examining committee, your final internship report may be used as an APP report. At the start of the internship, discuss with your internship advisor to establish requirements for the final report.

## Chapter 5. Useful Links and Websites

- Department of Geography homepage: <https://sbs.mnsu.edu/academics/geography>
- Graduate Studies homepage: <https://grad.mnsu.edu/>
- New student checklist: <https://grad.mnsu.edu/graduate-student-resources/new-student-checklist/>
- Important resources for all current students: <https://mankato.mnsu.edu/current-students/>
- Graduate degree completion requirements: <https://grad.mnsu.edu/graduate-student-resources/degree-completiongraduation/>
- Deadlines and important dates: <https://grad.mnsu.edu/graduate-student-resources/deadlines-and-important-dates/>
- Graduate studies forms: <https://grad.mnsu.edu/graduate-student-resources/graduate-forms/>
- Thesis, APP, and Comprehensive Exams: <https://grad.mnsu.edu/capstones/>
- Graduate Studies Thesis Format and Style Guidelines website: <https://grad.mnsu.edu/capstones/formatting-and-style-guidelines/>
- APP Requirements website: <https://grad.mnsu.edu/capstones/alternate-plan-paper-and-other-capstones/>
- Change of Advisor/Committee Member form: <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/change-of-advisor.pdf>
- Plan of Study form: <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/plan-of-study.pdf>
- List of Graduate Assistantships available outside of Geography: <https://admin.mnsu.edu/human-resources/career-opportunities/graduate-assistant-opportunities/>
- Graduate Assistantship Duty Day Calendar: [https://admin.mnsu.edu/globalassets/academic-affairs/forms/21-22\\_faculty\\_calendar.pdf](https://admin.mnsu.edu/globalassets/academic-affairs/forms/21-22_faculty_calendar.pdf)
- Department of Geography Scholarships and Field Studies/Research Awards: <https://sbs.mnsu.edu/academics/geography/scholarships-and-financial-assistance/>
- Scholarship Finder (to identify and apply for scholarships and field studies/research awards): <https://mnsu.academicworks.com/>

## Appendix 1. MS Geography Abbreviated Guide (i.e., “The Cheat Sheet”)

- 1. Establish your major advisor and examination committee (typically your first semester)**
  - a. An examination committee consists of at least three members
  - b. At least two members of the examination committee should be from Geography
    - i. One member can be from another department or an external member
      1. External members must have at least a master’s degree
    - ii. All committee members (including external members) must hold Graduate Faculty status at Minnesota State University, Mankato
  - c. Meet with your major advisor to establish expectations and timeline for graduation
  - d. Establish thesis or APP option and topic of your capstone
    - i. Determine if you need IRB approval for your research
    - ii. Determine if a proposal defense is required
  - e. Discuss and complete a *Plan of Study* form (available in Geography Office)
    - i. Indicate all the courses you have taken or plan to take at the graduate level
    - ii. Do not indicate more 500-level credits than 600-level credits
      1. If you have taken more 500-level credits simply leave some off the form if necessary (don’t worry, they will show up on your transcript)
    - iii. Get signatures from your major advisor, examination committee, and Graduate Program Director and turn in to Geography Office
- 2. Complete at least 30 credits for the Thesis option or 34 credits for the APP option**
  - a. Take GEOG 678 (3 credits; fall semester) and GEOG 680 (3 credits; spring semester)
  - b. Take at least 24 (Thesis) to 28 (APP) elective credits at 500/600 level
  - c. Ensure at least half of your total credits are at the 600 level
  - d. Ensure at least half of your total credits are within Geography
  - e. Take 3-6 credits of GEOG 699 (Thesis) or 1-2 credits of GEOG 694 (APP)
    - i. These do not count towards your 600-level credit total
  - f. You must be enrolled in at least one credit during fall and spring semesters and at least six credits during fall and spring semesters to be considered full time
  - g. You must enroll at least one credit during summer if you receive summer funding from a graduate assistantship, internship, or paid hourly position
- 3. Complete a Written Comprehensive Exam (typically third or fourth semester)**
  - a. Discuss your comprehensive exam with your advisor at least one month before you would like to take the exam and they will provide you with their exam guidelines
  - b. Complete the *Written Comprehensive Examination Request and Report* form (available in Geography Office) at least two weeks before your exam
    - i. Your major advisor must sign
    - ii. Turn form into Geography Office
- 4. Complete the *Application for Graduation* form (your final semester)**
  - a. Available at: <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/application-for-graduation.pdf>
  - b. Due the near the beginning of the semester you intend to graduate
  - c. Requires signatures from major advisor, examination committee, and graduate program coordinator

5. **Complete an Oral Examination (i.e., “defend” your thesis or APP capstone) (typically your final semester)**
  - a. Should be completed at least six weeks before the end of the semester
  - b. Provide a complete draft of your thesis to your examination committee and the Geography Office at least two weeks before your oral examination
  - c. This is a public event, and anyone can attend and ask questions
  - d. If revisions to your thesis or APP are required (based on your committee’s evaluation), you must complete those revisions and receive your major advisor and examination committee approval before you submit your final thesis or APP
  - e. Once all revisions are made,
6. **Submit your thesis or APP report(s) (typically your final semester)**
  - a. Submit final thesis to Office of Graduate Studies (*typically due ~4 weeks before end of final semester*)
    - i. <https://grad.mnsu.edu/capstones/thesis-or-dissertation/theses-or-dissertations/>
    - ii. Requires Endorsement/Signature page that includes your major advisor and examination committee signatures
      1. Should only be completed after a successful oral examination and all revisions have been approved by your major advisor and examination committee
    - iii. You may submit an electronic or paper/print version of your thesis
      1. Electronic copies are submitted online, and the Endorsement/Signature page is unsigned
        - a. Submit a signed paper copy of the Endorsement/Signature page to the Office of Graduate Studies by the semester deadline
      2. Print copies must be hand delivered to the Office of Graduate Studies by the semester deadline
        - a. Must submit at least four print copies
        - b. Must pay \$20.00 per copy for binding
        - c. Print copies must adhere to formatting and style requirements
  - b. Formal APP submission is not required
    - i. You submit all APP assignments to your major advisor and examination committee
    - ii. All APP assignment should follow the proper Format and Style Guidelines
7. **Complete Recommendation for Awarding the Degree form (typically your final semester)**
  - a. Available at: <https://grad.mnsu.edu/globalassets/college-of-graduate-studies-and-research/files/documents/forms/grad112fr-reccomendation-for-awarding-masters-degree-form-04-21.pdf>
  - b. Due no later than the last week of the semester you intend to graduate
  - c. Submit to Office of Graduate Studies (or you can turn in to Geography Office)
  - d. Requires your major advisor, examination committee, and graduate coordinator signatures