

# GEOGRAPHY

## DEPARTMENT OFFICE

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## Geography at NMU

The Geography Department offers a variety of programs in human geography, earth science, physical geography, geographic information science, planning, environmental conservation, and education, along with a certificate program in geographic information systems (GIS). The department is committed to excellence in teaching and preparing students for graduate study, professional careers in teaching, governmental service and the private sector.

Since geography is an integrative discipline, students, whether interested in its human or physical aspects, must have a basic understanding of the scope of the discipline and its methodologies. This is reflected in the department's core curriculum, which all geography students are required to take. It consists of courses in human and physical geography, three methods classes and a capstone course that integrates the human and physical aspects of the discipline by focusing on the interactions between humankind and the natural environment.

Geography majors have the opportunity to gain practical work experience through internships with local governmental agencies and the private sector.

## Student Organizations

- Gamma Theta Upsilon Honor Society
- Student Michigan Education Association
- Superior Geography Club

## Department Facility

- GIS and Remote Sensing Lab

## Department/Program Policies

As a requirement for graduation, all non-teaching geography department majors must have a minimum grade of "C" and a minimum cumulative grade point average of 2.25 for all courses constituting the major curriculum. Students majoring in secondary education earth science, secondary education geography, or minoring in geography education or earth science education must maintain a grade point average of 2.70 or greater with no

grade below a "C" in the professional education sequence, the major and/or minors and required cognates combined.

Students in the geographic information system certificate program must have a minimum grade of "B" in all courses in the technical concentration.

Students in the geographic information systems minor must earn a grade of "B" in all classes.

Students majoring in programs in the department must also do the following:

1. Successfully complete EN 211 and pass the NMU Writing Proficiency Exam before taking 300-level courses or above in the major.
2. Complete AIS 101 if required during the freshman year or within the first year of transferring to a major in the department.
3. Satisfy the prerequisites for each major course enrolled in as described in this bulletin.

*Note: Petition for exception to any of the program policies must be made in writing and submitted to the Geography Department. The petition must include reasons why an exception should be made and provide documentation of those reasons, if applicable.*

## BACHELOR DEGREE PROGRAMS

**Liberal Studies:** Complete information on the liberal studies requirements and additional graduation requirements, including the health promotion requirement, is in the "Liberal Studies Program and Graduation Requirements" section of this bulletin (38-44).

Courses within each major that can be used to satisfy liberal studies requirements are listed with the Roman numeral (in brackets) that coincides with the liberal studies division the course falls under.

### Earth Science Major

This major provides students with a thorough knowledge of Earth's physical environment including its geology, weather and climate, astronomical relationships and hydrology.

<b>Total Credits Required for Degree</b>	<b>124</b>
<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>
<b>Required Courses in Major</b>	<b>44</b>
AS 103 Observational and Solar System Astronomy [III]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 255 Physical Geology [III]	4
GC 260 Minerals and Rocks	4
GC 365 Historical Geology	4
GC 385 Weather and Climate	4
GC 390 Oceanography	2
GC 489 Human Impact on the Environment	4
GC 335 Geographic Information Systems or GC 425 Remote Sensing	4
GC 202 Soils or GC 370 Geomorphology (4 cr.) or GC 465 Hydrology (4 cr.)	4
<b>Other Required Courses</b>	<b>19</b>
AIS 101 Introduction to Information Resources	1
MA 104 College Algebra with Applications [III] (or higher)	4
PH 201 College Physics I [III] (or higher)	5
Biology Elective (BI 111 <i>Introductory Biology: Principles [III] recommended</i> )	4
Chemistry Elective (CH 111 <i>General Chemistry 1 [III] recommended</i> )	5
<b>Minor</b>	<b>20</b>

### Environmental Conservation Major

This major provides students with an introduction to quantitative and qualitative methods of assessing and analyzing humankind's impact upon the environment.

<b>Total Credits Required for Degree</b>	<b>124</b>
<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>
<b>Required Courses in Major</b>	<b>38</b>
GC 100 Physical Geography [III]	4
ENV 101 Introduction to Environmental Science [III]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 320 Environmental Policy and Regulation	4
GC 335 Geographic Information Systems	4
GC 475 Environmental Impact Assessment	4
GC 489 Human Impact Upon the Environment	4
GC 202 Soils or GC 255 Physical Geology (4 cr.) [III] or GC 370 Geomorphology (4 cr.) or GC 401 Biogeography (4 cr.) or GC 465 Hydrology (4 cr.) or GC 470 Environmental Ethics (4 cr.)	4
<b>Other Required Courses</b>	<b>5</b>
AIS 101 Introduction to Information Resources	1
CIS 110 Principles of Computer Information Systems [V]	4
<b>Minor</b>	<b>20</b>

### Geographic Information Science Major

This major provides students with knowledge and skills related to information technology, spatial data management, analysis and visualization.

<b>Total Credits Required for Degree</b>	<b>124</b>
<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>
<b>Required Courses in Major</b>	<b>46</b>
CS 120 Computer Science I [V]	4
CS 122 Computer Science II	4
CS 201 Programming in C++	4
GC 100 Physical Geography [III]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 335 Geographic Information Systems	4
GC 425 Remote Sensing	4
GC 428 Spatial Analysis	4

**Electives**

Choose from the following (one course must be at the 200 level or above):

- CS 222 Data Structures (4 cr.)
- CS 228 Network Programming (3 cr.)
- CS 302 Unix System Administration (4 cr.)
- CS 326 Object Oriented Design (3 cr.)
- CS 470 Artificial Intelligence (4 cr.)
- GC 337 Computer Cartography (4 cr.)
- GC 445 Advanced Aerial Photography Interpretation and Photogrammetry (2 cr.)
- GC 455 Digital Image Processing (2 cr.)
- GC 491 Internship in Geography (2-6 cr.)
- MA 240 Discrete Mathematics (3 cr.)
- IS 120 Computer Concepts (2 cr.) [V]
- CIS 155 Software Development with Databases (4 cr.)
- CIS 355 Web Application Programming (3 cr.)

<b>Other Required Course</b>	<b>1</b>
AIS 101 Introduction to Information Resources	1

<b>Minor or Cluster Minor</b>	<b>20</b>
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**Human Geography Major**

This major allows students to specialize in different systematic branches of the discipline such as urban, economic, political and regional geography.

<b>Total Credits Required for Degree</b>	<b>124</b>
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<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>

<b>Major</b>	<b>38</b>
GC 100 Physical Geography [III]	4
GC 164 Human Geography [IV]	4
GC 200 North America or GC 300 Regional Studies (4 cr.) [IV]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 489 Human Impact Upon the Environment	4
GC 335 Geographic Information Systems or GC 337 Computer Cartography (4 cr.) or GC 425 Remote Sensing (4 cr.) or GC 428 Spatial Analysis (4 cr.)	4

**Geography Electives** **8**

Choose from the following:

- GC 220 Economic Geography (4 cr.)
- GC 310 Urban Geography (4 cr.)
- GC 316 Geography of Tourism (4 cr.)
- GC 317 Geography of Food Systems (4 cr.)
- GC 360 Population Geography (4 cr.) [IV]

<b>Other Required Courses</b>	<b>5</b>
AIS 101 Introduction to Information Resources	1
CIS 110 Principles of Computer Information Systems [V]	4

<b>Minor or Cluster Minor</b>	<b>20</b>
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**8 Physical Geography Major**

This major is designed to provide students with a thorough knowledge of the Earth's physical environment including its climate, soil, vegetation, landforms and geology.

<b>Total Credits Required for Degree</b>	<b>124</b>
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<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>

<b>Required Courses in Major</b>	<b>38</b>
GC 100 Physical Geography [III]	4
GC 164 Human Geography [IV]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 489 Human Impact Upon the Environment	4
GC 335 Geographic Information Systems or GC 337 Computer Cartography (4 cr.) or GC 425 Remote Sensing (4 cr.) or GC 428 Spatial Analysis (4 cr.)	4

**Geography Electives** **12**

Choose from the following:

- GC 202 Soils (4 cr.)
- GC 255 Physical Geology (4 cr.) [III]
- GC 260 Minerals and Rocks (4 cr.)
- GC 365 Historical Geology (4 cr.)
- GC 370 Geomorphology (4 cr.)
- GC 385 Weather and Climate (4 cr.)
- GC 401 Biogeography (4 cr.)
- GC 465 Hydrology (4 cr.)

<b>Other Required Courses</b>	<b>5</b>
AIS 101 Introduction to Information Resources	1
CIS 110 Principles of Computer Information Systems [V]	4

<b>Minor or Cluster Minor</b>	<b>20</b>
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**Planning Major**

This program applies the planning process to land use decision making in small towns and rural areas. Students are provided with a solid background in the tools and techniques of planning and given the opportunity to gain practical experience by working on local planning issues.

<b>Total Credits Required for Degree</b>	<b>124</b>
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<b>Liberal Studies</b>	<b>30-40</b>
<b>Health Promotion</b>	<b>2</b>

<b>Required Courses in Major</b>	<b>42</b>
GC 100 Physical Geography [III]	4
GC 164 Human Geography [IV]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 330 Planning Theory and Practice	2
GC 340 Land Use Controls	2
GC 485 Planning Practicum	4

**Geography Electives**

Choose from the following:

GC 335 Geographic Information Systems (4 cr.)	
GC 337 Computer Cartography (4 cr.)	
GC 425 Remote Sensing (4 cr.)	
GC 428 Spatial Analysis (4 cr.)	

**Geography Electives**

Choose from the following:

GC 202 Soils (4 cr.)	
GC 220 Economic Geography (4 cr.)	
GC 310 Urban Geography (4 cr.)	
GC 316 Geography of Tourism (4 cr.)	
GC 320 Environmental Policy and Regulation (4 cr.)	
GC 360 Population Geography (4 cr.) [IV]	
GC 370 Geomorphology (4 cr.)	
GC 401 Biogeography (4 cr.)	
GC 465 Hydrology (4 cr.)	
GC 470 Environmental Ethics (4 cr.)	
GC 475 Environmental Impact Assessment (4 cr.)	
GC 491 Internship (2-4 cr.)	

**Other Required Courses**

ALS 101 Introduction to Information Resources	5
CIS 110 Principles of Computer Information Systems [V]	1
	4

**Minor or Cluster Minor** 20

**Secondary Education Earth Science Major**

Teaching certification is obtained by completing a major in earth science, a teaching minor and the professional education sequence. Advising for this major is provided by Dr. Mitchell D. Klett in the School of Education.

**Total Credits Required for Degree** 143-146

**Liberal Studies** 30-40  
**Health Promotion** 2

**Required Courses in Major** 36

AS 103 Observational and Solar System Astronomy [III]	4
GC 225 Introduction to Maps	2
GC 255 Physical Geology [III]	4
GC 260 Minerals and Rocks	4
GC 365 Historical Geology	4
GC 385 Weather and Climate	4
GC 390 Oceanography	2
GC 465 Hydrology	4
Choose from the following:	8
GC 202 Soils (4 cr.)	
GC 370 Geomorphology (4 cr.)	
GC 425 Remote Sensing (4 cr.)	

**Teaching Minor, minimum** 20-22

Choose from biology education, chemistry education or physics education.

**Other Required Courses** 16-17

MA 103 Finite Mathematics [III]	4
MA 271 Calculus with Applications	4

**8** Choose two courses from the following that are not in the selected minor area. 8-9

BI 100 Biological Science (4 cr.) [III]	
BI 111 Introductory Biology: Principles (4 cr.) [III]	
BI 112 Introductory Biology: Diversity (4 cr.) [III]	
CH 105 Chemical Principles (4 cr.) [III]	
PH 201 College Physics I (5 cr.) [III]	

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**Professional Education** 37

ED 201 Introduction to Education	2
ED 231 Teaching and Learning in the Secondary Classroom	4
ED 301 Dimensions of American Education	2
ED 319 Teaching of Reading for Secondary Teachers	3
ED 349 Teaching for Diversity, Equity and Social Justice in the Secondary School Community	2
ED 361 Special Education and the General Classroom Teacher	2
ED 430 Teaching in the Secondary School	11
ED 450 Seminar in Teaching	1
ED 483 Educational Media and Technology	2
MSED 340 Fundamental Concepts in Science	4
MSED 350 Methods and Materials in Teaching Science Education	4

**Secondary Education Geography Major**

Teaching certification is obtained by completing a major in geography, a teaching minor and the professional education sequence. Advising for this major is provided by the Geography Department.

**Total Credits Required for Degree** 129-133

**Liberal Studies** 30-40  
**Health Promotion** 2

**Required Courses in Major** 34

GC 100 Physical Geography [III]	4
GC 164 Human Geography [IV]	4
GC 200 North America or GC 300 Regional Studies [IV]	4
GC 205 Introduction to Geographic Research	4
GC 225 Introduction to Maps	2
GC 235 Quantitative Methods	4
GC 489 Human Impact Upon the Environment	4
GC 337 Computer Cartography or GC 425 Remote Sensing (4 cr.) or GC 428 Spatial Analysis (4 cr.)	4
GC 220 Economic Geography or GC 310 Urban Geography (4 cr.) or GC 316 Geography of Tourism (4 cr.) or GC 360 Population Geography (4 cr.) [IV] or GC 435 Geography of Michigan (4 cr.)	4

**Teaching Minor, minimum** 20-24

**Professional Education** 33

ED 201 Introduction to Education	2
ED 231 Teaching and Learning in the Secondary Classroom	4
ED 301 Dimensions of American Education	2
ED 319 Teaching of Reading for Secondary Teachers	3
ED 349 Teaching for Diversity, Equity and Social Justice in the Secondary School Community	2
GC 350 Methods and Materials in Teaching Social Studies Education	4

ED 361 Special Education and the General Classroom Teacher	2
ED 430 Teaching in the Secondary School	11
ED 450 Seminar in Teaching	1
ED 483 Educational Media and Technology	2

## MINOR PROGRAMS

### Earth Science Minor

<b>Total Credits Required for Minor</b>	<b>20</b>
GC 225 Introduction to Maps	2
GC 255 Physical Geology	4
GC 365 Historical Geology	4
GC 385 Weather and Climate	4
GC 390 Oceanography	2
AS 103 Observational and Solar System Astronomy or	4
GC 202 Soils (4 cr.) or	
GC 260 Minerals and Rocks (4 cr.) or	
GC 370 Geomorphology (4 cr.) or	
GC 465 Hydrology (4 cr.)	

### Environmental Conservation Minor

<b>Total Credits Required for Minor</b>	<b>20</b>
GC 100 Physical Geography	4
ENV 101 Introduction to Environmental Science	4
GC 320 Environmental Policy and Regulation	4
<b>Geography Electives</b>	<b>8</b>
<i>Choose from the following:</i>	
GC 202 Soils (4 cr.)	
GC 401 Biogeography (4 cr.)	
GC 465 Hydrology (4 cr.)	
GC 470 Environmental Ethics (4 cr.)	
GC 475 Environmental Impact Assessment (4 cr.)	

### Geographic Information Systems Minor

<b>Total Credits Required for Minor</b>	<b>24</b>
GC 225 Introduction to Maps	2
GC 335 Geographic Information Systems	4
GC 337 Computer Cartography	4
GC 425 Remote Sensing	4
GC 428 Spatial Analysis	4
GC 001 Geographic Information Systems Certified	0
<b>Electives</b>	<b>6</b>
<i>Choose from the following:</i>	
GC 445 Advanced Air Photo (2 cr.)	
GC 455 Digital Image Processing (2 cr.)	
DD 110 CAD Productivity and Customization (2 cr.)	
CS 120 Computer Science I (4 cr.)	
CIS 155 Software Development with Databases (4 cr.)	
GC 491 Internship in GIS (2-4 cr.)	

*Note: The GIS minor is granted only to those students who achieve a minimum grade of "B" in all courses.*

### Geography Cluster Minor

For geography department non-teaching majors only.

<b>Total Credits Required for Minor</b>	<b>20</b>
<i>Note: The cluster minor may consist of courses that emphasize the physical, cultural or applied (planning) areas of the discipline. Approval of a cluster minor must be obtained from each department contributing two or more courses to the minor. Courses comprising the cluster minor must be submitted to the Degree Audits Office during the student's third semester at NMU.</i>	

### Human Geography Minor

<b>Total Credits Required for Minor</b>	<b>22</b>
GC 100 Physical Geography	4
GC 164 Human Geography	4
GC 225 Introduction to Maps	2
<b>Geography Electives</b>	<b>12</b>
<i>Choose from the following:</i>	
GC 220 Economic Geography (4 cr.)	
GC 300 Regional Studies (4 cr.)	
GC 310 Urban Geography (4 cr.)	
GC 316 Geography of Tourism (4 cr.)	
GC 360 Population Geography (4 cr.)	

### Physical Geography Minor

<b>Total Credits Required for Minor</b>	<b>22</b>
GC 100 Physical Geography	4
GC 225 Introduction to Maps	2
GC 370 Geomorphology	4
GC 385 Weather and Climate	4
<b>Geography Electives</b>	<b>8</b>
<i>Choose from the following:</i>	
GC 202 Soils (4 cr.)	
GC 255 Physical Geology (4 cr.)	
GC 401 Biogeography (4 cr.)	
GC 465 Hydrology (4 cr.)	

### Planning Minor

<b>Total Credits Required for Minor</b>	<b>22</b>
GC 100 Physical Geography	4
GC 164 Human Geography	4
GC 225 Introduction to Maps	2
GC 330 Planning Theory and Practice	2
GC 340 Land Use Controls	2
<b>Geography Electives</b>	<b>8</b>
<i>Choose from the following:</i>	
GC 220 Economic Geography (4 cr.)	
GC 310 Urban Geography (4 cr.)	
GC 320 Environmental Policy and Regulation (4 cr.)	
GC 335 Geographic Information Systems (4 cr.)	
GC 475 Environmental Impact Assessment (4 cr.)	

## Secondary Education Earth Science Minor

<b>Total Credits Required for Minor</b>	<b>22-30*</b>
AS 103 Observational and Solar System Astronomy	4
GC 255 Physical Geology	4
GC 385 Weather and Climate	4
GC 465 Hydrology	4
<i>Choose from the following:</i>	<b>6-8</b>
GC 202 Soils (4 cr.)	
GC 225 Maps (2 cr.)	
GC 365 Minerals and Rocks (4 cr.)	
GC 370 Geomorphology (4 cr.)	
GC 390 Oceanography (2 cr.)	
MSED 340 Fundamental Concepts in Science*	4
MSED 350 Methods and Materials in Teaching Science Education*	4

*\*Not required if major is biology education, chemistry education, physics education or integrated science education.*

## Secondary Education Geography Minor

<b>Total Credits Required for Minor</b>	<b>22-26*</b>
GC 100 Physical Geography	4
GC 164 Human Geography	4
GC 200 North America	4
GC 220 Economic Geography	4
GC 225 Introduction to Maps	2
GC 350 Methods and Materials in Teaching Social Studies Education*	4
GC 435 Geography of Michigan	4

*\*Not required if major is economics education, history education, political science education or social studies education.*

## CERTIFICATE PROGRAM

### Geographic Information Systems Certificate

This program is designed to provide students with the practical skills and theoretical knowledge necessary to enter the rapidly expanding field of geographic information science.

<b>Total Credits Required for Certificate</b>	<b>35</b>
<b>Health Promotion</b>	<b>1</b>
HP 200 Physical Well Being	1
<b>Technical Concentration*</b>	<b>22</b>
GC 225 Introduction to Maps	2
GC 335 Geographic Information Systems	4
GC 337 Computer Cartography	4
GC 425 Remote Sensing	4
GC 428 Spatial Analysis	4
<b>Electives</b>	<b>4</b>
<i>Choose from the following:</i>	
GC 445 Advanced Air Photo (2 cr.)	
GC 455 Digital Image Processing (2 cr.)	
DD 110 CAD Productivity and Customization (2 cr.)	
CS 120 Computer Science I (4 cr.)	
CIS 155 Software Development with Databases (4 cr.)	
GC 491 Internship in GIS, Remote Sensing or Cartography (2-4 cr.)	
<b>Other Required Courses</b>	<b>12</b>
MA 104 College Algebra or equivalent	4
CIS 110 Principles of Computer Information Systems or equivalent	4
GC 235 Quantitative Methods or equivalent	4

*\*A minimum grade of "B" is required in the technical concentration.*