Geography

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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
• Rock and Mineral 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 majoring in programs in the department must also do the following:
1. Successfully complete EN 211 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.

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.

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Required Courses in Major 44
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 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.)

Other Required Courses 19
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 4
(8 111 Introductory Biology: Principles [III] recommended)
Chemistry Elective 5
(CH 111 General Chemistry 1 [III] recommended)

Minor 20

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.

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Required Courses in Major 38
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.)

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

Minor 20

Geographic Information Science Major

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

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Required Courses in Major 34
CIS 155 Software Development with Databases 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 337 Computer Cartography 4
GC 425 Remote Sensing 4
GC 428 Spatial Analysis 4

Minor 20
Electives 12
CS 120 Computer Science I [V] 4
CS 122 Computer Science II 4
CS 201 Programming in C++ 3
CS 222 Data Structures 4
CS 302 Unix System Administration 4
CS 326 Object Oriented Design 3
CS 470 Artificial Intelligence 4
CIS 355 Web Application Programming 3
GC 330 Planning Theory and Practice 2
GC 445 Advanced Aerial Photography Interpretation and Photogrammetry 2
GC 455 Digital Image Processing 2
GC 491 Internship in Geography 2-6
IS 120 Computer Concepts [V] 2
MA 240 Discrete Mathematics 3

Other Required Courses 9
AIS 101 Introduction to Information Resources 1
CIS 110 Principles of Computer Information Systems [V] 4
GC 164 Human Geography [IV] 4

Minor or Cluster Minor 20

Human Geography Major

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

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Major 38
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.)

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]

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

Minor or Cluster Minor 20

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.

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Required Courses in Major 38
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.)

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.)

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

Minor or Cluster Minor 20

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.

Total Credits Required for Degree 124

Liberal Studies 30-40
Health Promotion 2

Required Courses in Major 42
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
Choose two courses from the following that are not in the selected minor area.

- 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]

**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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GC 100</td>
<td>Physical Geography [III]</td>
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<tr>
<td>GC 164</td>
<td>Human Geography [IV]</td>
<td>4</td>
</tr>
<tr>
<td>GC 200</td>
<td>North America or GC 300 Regional Studies [IV]</td>
<td>4</td>
</tr>
<tr>
<td>GC 225</td>
<td>Introduction to Maps</td>
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</tr>
<tr>
<td>GC 255</td>
<td>Physical Geology [III]</td>
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<tr>
<td>GC 260</td>
<td>Minerals and Rocks</td>
<td>4</td>
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<tr>
<td>GC 365</td>
<td>Historical Geology</td>
<td>4</td>
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<td>GC 385</td>
<td>Weather and Climate</td>
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<tr>
<td>GC 390</td>
<td>Oceanography</td>
<td>2</td>
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<tr>
<td>GC 465</td>
<td>Hydrology</td>
<td>4</td>
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<tr>
<td>GC 425</td>
<td>Remote Sensing (4 cr.)</td>
<td>8-9</td>
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<tr>
<td>GC 428</td>
<td>Spatial Analysis (4 cr.)</td>
<td>4</td>
</tr>
<tr>
<td>GC 310</td>
<td>Urban Geography [IV]</td>
<td>4</td>
</tr>
<tr>
<td>GC 316</td>
<td>Geography of Tourism</td>
<td>4</td>
</tr>
<tr>
<td>GC 360</td>
<td>Population Geography (4 cr.) [IV]</td>
<td>4</td>
</tr>
<tr>
<td>GC 370</td>
<td>Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GC 401</td>
<td>Biogeography</td>
<td>4</td>
</tr>
<tr>
<td>GC 465</td>
<td>Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>GC 470</td>
<td>Environmental Ethics (4 cr.)</td>
<td>4</td>
</tr>
<tr>
<td>GC 475</td>
<td>Environmental Impact Assessment (4 cr.)</td>
<td>4</td>
</tr>
<tr>
<td>GC 491</td>
<td>Internship (2-4 cr.)</td>
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**Teaching Minor, minimum** 20-24

Choose from biology education, chemistry education or physics education.

**Other Required Courses** 16-17

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>MA 103</td>
<td>Finite Mathematics [III]</td>
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<tr>
<td>MA 271</td>
<td>Calculus with Applications</td>
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<tr>
<td>MA 350</td>
<td>Methods and Materials in Teaching Social Education</td>
<td>4</td>
</tr>
</tbody>
</table>
MINOR PROGRAMS

Earth Science Minor

Total Credits Required for Minor 20
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 4
AS 103 Observational and Solar System Astronomy or
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

Total Credits Required for Minor 20
GC 100 Physical Geography 4
BVN 101 Introduction to Environmental Science 4
GC 320 Environmental Policy and Regulation 4
Geography Electives
Choose from the following:
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

Total Credits Required for Minor 24
Required Courses 18
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
Electives
CIS 155 Software Development with Databases 4
CIS 355 Web Application Programming 3
CS 120 Computer Science I 4
CS 122 Computer Science II 4
CS 201 Programming in C++ 3
CS 222 Data Structure 4
CS 302 Unix System Administration 4
CS 326 Object Oriented Design 3
CS 470 Artificial Intelligence 4
DD 110 CAD Productivity and Customization 2
GC 330 Planning Theory and Practice 2
GC 445 Advanced Aerial Photography Interpretation and Photogrammetry 2
GC 455 Digital Image Processing 2
GC 491 Internship in Geography 2-6
IS 120 Computer Concepts 2
MA 240 Discrete Mathematics 3

Human Geography Minor

Total Credits Required for Minor 22
GC 100 Physical Geography 4
GC 164 Human Geography 4
GC 225 Introduction to Maps 2
Geography Electives 12
Choose from the following:
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

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

**Total Credits Required for Minor** 22

- GC 100 Physical Geography 4
- GC 105 World Regional Geography or 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

### Geography Electives

Choose from the following:
- 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

**Total Credits Required for Minor** 22-30*

- AS 103 Observational and Solar System Astronomy 4
- GC 255 Physical Geology 4
- GC 385 Weather and Climate 4
- GC 465 Hydrology 4

Choose from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GC 202 Soils (4 cr.)</td>
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</tr>
<tr>
<td>GC 225 Maps (2 cr.)</td>
<td></td>
</tr>
<tr>
<td>GC 365 Minerals and Rocks (4 cr.)</td>
<td></td>
</tr>
<tr>
<td>GC 370 Geomorphology (4 cr.)</td>
<td></td>
</tr>
<tr>
<td>GC 390 Oceanography (2 cr.)</td>
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</tr>
</tbody>
</table>

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

**Total Credits Required for Certificate** 35

- **Health Promotion** 1
  - HP 200 Physical Well Being 1

- **Technical Concentration** 18
  - 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

- **Electives** 4
  - CIS 155 Software Development with Databases 4
  - CIS 355 Web Application Programming 3
  - CS 120 Computer Science I 4
  - CS 122 Computer Science II 4
  - CS 201 Programming in C++ 3
  - CS 222 Data Structure 4
  - CS 302 Unix System Administration 4
  - CS 326 Object Oriented Design 3
  - CS 470 Artificial Intelligence 4
  - DD 110 CAD Productivity and Customization 2
  - GC 330 Planning Theory and Practice 2
  - GC 445 Advanced Aerial Photography Interpretation and Photogrammetry 2
  - GC 455 Digital Image Processing 2
  - GC 491 Internship in Geography 2-6
  - IS 120 Computer Concepts 2
  - MA 240 Discrete Mathematics 3

- **Other Required Courses** 12
  - CIS 110 Principles of Computer Information Systems or equivalent 4
  - GC 235 Quantitative Methods or equivalent 4
  - MA 104 College Algebra or equivalent 4

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