**GIS/Environmental Remote Sensing/Geospatial Technologies Minor Advising Guide**

**Update December 2023**

**GEOGRAPHIC INFORMATION SCIENCE (GIS) AND TECHNOLOGY UNDERGRADUATE CERTIFICATE**

Completed through the Geography Department. This certificate contains coursework that includes introduction and understanding to GIS applications.

**COURSEWORK:**

Students will complete a minimum of 13 credit hours to receive certification in GIS. Up to six credits can be transferred from another institution (subject to course content approval).

**Core requirements:**

GPY 200 - Computer Cartography (3 credits) *\*\*\*(See Below)*

GPY 307 - Introduction to Geographic Information Systems (3 credits)

GPY 407 - Advanced GIS (4 credits)

**Electives (Choose One):**

CIS 160 - Learn to Code in Python (3 credits)

CIS 162 - Computer Science I (4 credits)

CIS 233 - Concepts of Database Systems (3 credits)

GEO 425 - GIS Applications in Geology (3 credits)

GPY 365 - GIS for Economic and Business Decision-Making (3 credits)

GPY 370 - Introduction to Remote Sensing (3 credits)

GPY 385 - GIS in Urban and Regional Analysis (3 credits)

GPY 470 - Digital Image Processing (3 credits)

NRM 250 - Natural Resource Measurements and Mapping (3 credits)

NRM 405 - GIS Applications in Natural Resources (3 credits)

NRM 450 - Applied Spatial Analysis of Natural Resources (3 credits)

**\*\*\* Natural resources management (NRM) majors pursuing the NRM resource analysis methods emphasis may substitute the following for GPY 200: NRM 250 - Natural Resource Measurements and Mapping (3 credits), NRM 405 - GIS Applications in Natural Resources (3 credits), NRM 450 - Applied Spatial Analysis of Natural Resources (3 credits) \*\*\***

*To complete the certificate requirements: 3 core classes equal 10 credits and 1 elective course at 3 credits. Total 13 credits*

[GIS & Technology Certificate - Geography and Sustainable Planning - Grand Valley State University (gvsu.edu)](https://www.gvsu.edu/geography/gis-technology-certificate-47.htm)

**APPLIED GEOGRAPHIC INFORMATION SYSTEMS (GIS) IN NATURAL RESOURCES, UNDERGRADUATE CERTIFICATE**

Completed through the Biology Department. This certificate is application-based learning with GIS skills that can be applied through many different data sets in multidisciplinary applications such as, fisheries, aquatic science, wildlife, environmental science, biology, and NRM.

**Coursework:**

Students will complete a minimum of 12 to 13 credit hours to receive certification in GIS. Up to three credits can be transferred from another institution (subject to course content approval).

**Core requirements:**

NRM 250 - Natural Resource Measurements and Mapping (3 credits)

NRM 405 - GIS Applications in Natural Resources (3 credits) \*prereq NRM 250 or GPY 307

NRM 450 - Applied Spatial Analysis of Natural Resources (3 credits) \*prereq NRM 405 or GPY 307

**Electives (Choose One) \*\*\* (See Below):**

CIS 160 - Learn to Code in Python (3 credits)

GEO 425 - GIS Applications in Geology (3 credits) (prereq GPY 307 or NRM 405)

GPY 370 - Introduction to Remote Sensing (3 credits)

GPY 407 - Advanced GIS (4 credits) (prereq GPY 307)

STA 418 - Statistical Computing and Graphics with R (3 credits) (prereq STA 215 or STA 220 or STA 312) and (STA 216 or CIS 162)

**\*\*\* New Course NRM 380-03 Intro to Web GIS offered Winter 2024 can be substituted in as an elective to fulfil the certificate requirements. \*\*\***

*To complete the certificate requirements: 3 core classes equal 12 credits and 1 elective course at 3 or 4 credits. Total 12 or 13 credits*

[Applied Geographic Information Systems (GIS) in Natural Resources, Undergraduate Certificate - Program Requirements - 2023-2024 Undergraduate & Graduate Catalog - Grand Valley State University (gvsu.edu)](https://www.gvsu.edu/catalog/program/applied-geographic-information-systems-gis-in-natural-recourses-undergraduate-certificate.htm)

**ENVIRONMENTAL REMOTE SENSING (RS) UNDERGRADUATE CERTIFICATE**

Completed through the Geography Department. This certificate is teaching students a variety Remote Sensing applications such as, Erdas Imagine, Terraset, eCognition, and ESRI ArcGIS.

**Coursework:**

Students will complete ***a minimum of 12 credit hours*** to receive certification in environmental remote sensing. Up to six credits can be transferred from another institution (subject to course content approval).

**Core Requirements:**

GPY 370 - Introduction to Remote Sensing (3 credits)

GPY 470 - Digital Image Processing (3 credits)

**Electives (Pick Two Courses):**

CIS 160 - Learn to Code in Python (3 credits)

CIS 162 - Computer Science I (4 credits)

CIS 233 - Concepts of Database Systems (3 credits)

GEO 425 - GIS Applications in Geology (3 credits)

GPY 307 - Introduction to Geographic Information Systems (3 credits)

GPY 365 - GIS for Economic and Business Decision-Making (3 credits)

GPY 385 - GIS in Urban and Regional Analysis (3 credits)

GPY 407 - Advanced GIS (4 credits)

NRM 250 - Natural Resource Measurements and Mapping (3 credits)

NRM 405 - GIS Applications in Natural Resources (3 credits)

NRM 450 - Applied Spatial Analysis of Natural Resources (3 credits)

**\*\*\* New Course NRM 380-03 Intro to Web GIS offered Winter 2024 can be substituted in as an elective to fulfil the certificate requirements. \*\*\***

*To complete the certificate requirements: 2 core classes equal 6 credits and 2 elective courses at 3 or 4 credits. Total 12 minimum credits*

[Environmental Remote Sensing (RS) Undergraduate Certificate - Program Requirements - 2023-2024 Undergraduate & Graduate Catalog - Grand Valley State University (gvsu.edu)](https://www.gvsu.edu/catalog/program/environmental-remote-sensing-rs-certificate.htm)

**GEOSPATIAL TECHNOLOGY MINOR**

Completed through the Geography Department. The minor includes course work and learning in remote sensing and GIS applications. Often the minor can be obtained while completing the GIS certificate and Environmental Remote Sensing certificate.

**Coursework:**

Students will complete 21-23 credits to receive the minor.

**Core Requirements:**

GPY 200 - Computer Cartography (3 credits)

GPY 307 - Introduction to Geographic Information Systems (3 credits)

GPY 370 - Introduction to Remote Sensing (3 credits)

**Elective (Pick Four Courses):**

CIS 160 - Learn to Code in Python (3 credits)

CIS 162 - Computer Science I (4 credits)

CIS 233 - Concepts of Database Systems (3 credits)

CIS 260 - Application Development in Visual Basic (4 credits)

GEO 425 - GIS Applications in Geology (3 credits)

GPY 365 - GIS for Economic and Business Decision-Making (3 credits)

GPY 385 - GIS in Urban and Regional Analysis (3 credits)

GPY 407 - Advanced GIS (4 credits)

GPY 470 - Digital Image Processing (3 credits)

NRM 250 - Natural Resource Measurements and Mapping (3 credits)

NRM 405 - GIS Applications in Natural Resources (3 credits)

NRM 450 - Applied Spatial Analysis of Natural Resources (3 credits)

*To complete the minor requirements: 3 core classes equal 6 credits and 4 elective courses at 3 or 4 credits. Total 21-23 credits*

[Geospatial Technology Minor - Program Requirements - 2023-2024 Undergraduate & Graduate Catalog - Grand Valley State University (gvsu.edu)](https://www.gvsu.edu/catalog/program/geospatial-technology-minor.htm#anchor-1)

**Considerations:**

* Courses can be double counted for multiple certificates/minors.
* Students need to apply for certificates prior to applying for graduation, preferably when course requirements are completed so certificate audit can be completed by appropriate department to prevent delays with registrar’s office.
* Questions about the certificates/minor can be directed certificate administrators:
	+ Geography- Gang Xu xug@gvsu.edu
	+ Biology- Ali Locher lochera@gvsu.edu