GIS 3782 - GIS Applications for the Natural Sciences

Fall 2026 Syllabus, Section 01, CRN 43258,

Credit hours: 3

Instructor

Peter Kimosop

Email: pkimosop@ysu.edu

Public Instructor Information

Instructor Title: Associate Professor

Instructor Professional Qualifications:
Certified Remote Pilot, Federal Aviation Administration (FAA), 2025
GIS Professional Certification (GISP), GIS Certification Institute, 2015
Ph.D., Geography, University of Cincinnati, 2011
Master's, Geography, Western Michigan University, 2005
Bachelor's, Geography, University of Nairobi, 2000

Instructor Office Location: Moser 2105

Instructor Office Phone: (330) 941-3052

Course Description

3782. GIS Applications for the Natural Sciences. Applications of Geographic Information Science (GIS) techniques for the natural sciences in disciplines such as physical geography, geology, biology, ecology, natural hazards, environmental monitoring, planning and infrastructure, water resources, climate change, and energy. Topics range from spatial data quality, data conversion, database design, data management, analysis, and visualization. Prereq.: GEOG 2611. Prereq. or Coreq.: GIS 2611. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	GIS Fundamentals: A First Text on Geographic Information Systems, 7th Edition	Bolstad and Manson	9780971764750

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Chapter 1	Introduction to GIS and ArcGIS Pro . NSA 1: Intro to ArcGIS Pro .	No Assignments Due
8/31	Chapter 3	Datums, coordinate systems, and map projections . NSA 2: Datums and Projections .	NSA 1 — Due Thursday, September 2 at 2:00 p.m.

9/7	Chapter 2	Geospatial Data . NSA 3: Exploring spatial data .	NSA 2 — Due Thursday, September 10 at 2:00 p.m.
9/14	Chapter 8	Attribute Tables and Geodatabases . NSA 4: Data Queries, Geodatabase Creation . Applications Challenge 1 .	NSA 3 — Due Thursday, September 17 at 2:00 p.m.
9/21	Chapter 4	Digital Cartography . NSA 5: Intro to symbology and Cartography .	NSA 4 — Due Thursday, September 24 at 2:00 p.m.
9/28		Introduction to Web GIS . NSA 6: Intro to ArcGIS Online and Web Apps .	NSA 5 — Due Thursday, October 1 at 2:00 p.m. . Applications Challenge 1 — Due Thursday, October 1 at 2:00 p.m. .
10/5	Chapters 5 & 6	Global Navigation Satellite Systems (GNSS), Sensor Comparisons, Survey 123 . NSA 7: GNSS Planning, Survey 123, and Field Maps . Applications Challenge 2 .	NSA 6 — Due Thursday, October 8 at 2:00 p.m.
10/12	Chapter 4	Data entry, data editing, georeferencing, transformations . NSA 8: Digitizing, Georeferencing and Resampling .	NSA 7 — Due Thursday, October 15 at 2:00 p.m.
10/19	Chapter 7	Finding Data . NSA 9: Finding Data on the web . Midterm Exam .	NSA 8 — Due Thursday, October 22 at 2:00 p.m. . Midterm Exam — Thursday, October 22, 2:00-3:15 p.m. .
10/26	Chapter 9	Vector Anaysis . NSA 10: Spatial analysis & Vector-Based Analysis .	NSA 9 — Due Thursday, October 29 at 2:00 p.m. . Applications Challenge 2 — Due Thursday, October 29 at 2:00 p.m. .
11/2	Chapter 10	Raster Analysis . NSA 11: Raster-Based Analysis . Applications Challenge 3 .	NSA 10 — Due Thursday, November 5 at 2:00 p.m.
11/9	Chapter 11	Terrain Analysis . NSA 12: Digital Terrain Analysis & Working with LiDAR data .	NSA 11 — Due Thursday, November 12 at 2:00 p.m.

11/16	Chapter 11	Surface Hydrologic Analysis . NSA 13: Surface Hydrologic Analysis .	NSA 12 — Due Thursday, November 19 at 2:00 p.m. . Applications Challenge 3 — Due Thursday, November 19 at 2:00 p.m. .
11/23	.	Applications Challenge 4	NSA 13 — Due Tuesday, November 24 at 2:00 p.m. .
11/30	Chapter 12 .	Spatial Interpolation . NSA 14: Intro to Spatial Interpolation .	NSA 14 — Due Friday, December 4 at 11:59 p.m. . Applications Challenge 4 — Due Friday, December 4 at 11:59 p.m.
12/7	Final Exam — Thursday, December 10, 1:00–3:00 p.m. .		

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.