

# Geography (GEOG)

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## **GEOG 105. Fundamentals of Geographic Information Systems. 3 Credits.**

Basics of integration and analyses of spatial data to visualize relationships, seek explanations, and develop solutions to problems. Emphases are placed on the nature of geographic information and the ways digital methods support geographic analyses and modeling.

## **GEOG 151. Human Geography. 3 Credits.**

Non-ethnocentric understanding of geography of human lifestyles and activities; their place and role in human-environment interaction.

## **GEOG 161. World Regional Geography. 3 Credits.**

Study of geographic processes shaping major world regions and inter-relationships in the global village; geographic bases and implications of current world events.

## **GEOG 194. Individual Study. 1-3 Credits.**

## **GEOG 196. Field Experience. 1-15 Credits.**

## **GEOG 199. Special Topics. 1-5 Credits.**

## **GEOG 262. Geography of North America. 3 Credits.**

Spatial approach to the development of the United States and Canada, which stresses changing cultural landscapes and assessing impacts of planning for resource utilization.

## **GEOG 291. Seminar. 1-3 Credits.**

## **GEOG 292. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

## **GEOG 294. Individual Study. 1-5 Credits.**

## **GEOG 299. Special Topics. 1-5 Credits.**

## **GEOG 379. Global Seminar. 1-6 Credits.**

NDSU instructed experience or field study in a foreign country. Conducted in English for residence credit. Pre-requisite: Prior approval by International Student and Study Abroad Services and major department. May be repeated. Standard Grading.

## **GEOG 391. Seminar. 1-3 Credits.**

## **GEOG 392. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

## **GEOG 394. Individual Study. 1-5 Credits.**

## **GEOG 399. Special Topics. 1-5 Credits.**

## **GEOG 412. Geomorphology. 3 Credits.**

Land forms and the processes by which they are formed and modified. Prereq: GEOL 105, GEOL 105L. Cross-listed with GEOL 412. {Also offered for graduate credit - see GEOG 612.}

## **GEOG 455. Introduction to Geographic Information Systems. 4 Credits.**

Application of the principles of geographic information systems and integrally related mapping to solve problems related to environment site characterizations, resource exploration, soil and groundwater contamination, geological and geotechnical investigations, waste management, construction, etc. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units. {Also offered for graduate credit - see GEOG 655.}

## **GEOG 456. Advanced Geographic Information Systems. 3 Credits.**

Application and analysis of advanced techniques and principles of geographic information systems and remote sensing technologies to fully address spatial and time related problems related to urban site characterizations, hydrologi analyses, risk assessment, policy making, disaster response and strategic defense techniques. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units. Prereq: GEOG 455. {Also offered for graduate credit - see GEOG 656.}

## **GEOG 465. Remote Sensing of the Environment. 3 Credits.**

This course will focus on developing practical skills for using various types of accessible remote sensing technologies as applied to environmental sciences. We will learn to work with aerial photographs, aerial lidar data, Terrestrial Laser Scanning (TLS), structure from motion (sfm), and Unmanned Aerial Vehicles (UAVs). We will explore the drawbacks and benefits of each technology and how it can be used to gather information and measure change in the environment. Cross-listed with GEOL 465. {Also offered for graduate credit - See GEOG 665.}

**GEOG 470. Remote Sensing. 3 Credits.**

Application of principles of Remote Sensing technology to integrate multiple interrelated data, to identify and/or accentuate spectral indices, magnetic force, electromagnetic energy and other remotely collected data to analyze temporal and spatial variation. Cross-listed with GEOL. {Also offered for graduate credit - see GEOG 670.}.

**GEOG 480. Geographic Information Systems Pattern Analysis and Modeling. 3 Credits.**

Application of GIS for determination of: factors or variables that influence geospatial patterns, data limitations in spatial and temporal continuum scales, identification of data anomalies, optimal data prediction, and evaluation of prediction uncertainty. Prereq: GEOG 455. Cross-listed with GEOL 480. {Also offered for graduate credit - see GEOG 680.}.

**GEOG 491. Seminar. 1-5 Credits.**

**GEOG 492. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

**GEOG 494. Individual Study. 1-5 Credits.**

**GEOG 496. Field Experience. 1-15 Credits.**

**GEOG 499. Special Topics. 1-5 Credits.**

**GEOG 612. Geomorphology. 3 Credits.**

Land forms and the processes by which they are formed and modified. Cross-listed with GEOL 612. {Also offered for undergraduate credit - see GEOG 412.}.

**GEOG 655. Introduction to Geographic Information Systems. 4 Credits.**

Application of the principles of geographic information systems and integrally related mapping to solve problems related to environment site characterizations, resource exploration, soil and groundwater contamination, geological and geotechnical investigations, waste management, construction, etc. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units. {Also offered for undergraduate credit - see GEOG 455.}.

**GEOG 656. Advanced Geographic Information Systems. 3 Credits.**

Application and analysis of advanced techniques and principles of geographic information systems and remote sensing technologies to fully address spatial and time related problems related to urban site characterizations, hydrologi analyses, risk assessment, policy making, disaster response and strategis defense techniques. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units. Prereq: GEOG 655. {Also offered for undergraduate credit - see GEOG 456.}.

**GEOG 665. Remote Sensing of the Environment. 3 Credits.**

This course will focus on developing practical skills for using various types of accessible remote sensing technologies as applied to environmental sciences. We will learn to work with aerial photographs, aerial lidar data, Terrestrial Laser Scanning (TLS), structure from motion (sfm), and Unmanned Aerial Vehicles (UAVs). We will explore the drawbacks and benefits of each technology and how it can be used to gather information and measure change in the environment. Cross-listed with GEOL. {Also offered for undergraduate credit - See GEOG 465}.

**GEOG 670. Remote Sensing. 3 Credits.**

Application of principles of Remote Sensing technology to integrate multiple interrelated data, to identify and/or accentuate spectral indices, magnetic force, electromagnetic energy and other remotely collected data to analyze temporal and spatial variation. Cross-listed with GEOL. {Also offered for undergraduate credit - see GEOG 470.}.

**GEOG 680. Geographic Information Systems Pattern Analysis and Modeling. 3 Credits.**

Application of GIS for determination of: factors or variables that influence geospatial patterns, data limitations in spatial and temporal continuum scales, identification of data anomalies, optimal data prediction, and evaluation of prediction uncertainty. Prereq: GEOG 655. Cross-listed with GEOL 680. {Also offered for undergraduate credit - see GEOG 480.}.

**GEOG 696. Special Topics. 1-5 Credits.**