Geography and Geographic Information Science

M.S. in Geography (https://catalog.und.edu/graduateacademicinformation/departmentalcoursesprograms/geography/geog-ms/)

Certificate in Geographic Information Systems (GISc) (https://catalog.und.edu/graduateacademicinformation/departmentalcoursesprograms/geography/geog-gis-cert/)

GEOG 500. Graduate Studies in Geography. 1 Credit.
An overview of contemporary research in geography, with different topics each semester. F,S.

GEOG 501. Geographic Thought Through Time. 2 Credits.
A scholarly examination of the scope and content of geography from its inception to the present. On demand.

GEOG 521. Advanced Physical Geography. 3 Credits.
An investigation of an advanced topic in physical geography. May be repeated if a different topic is examined. Prerequisite: Instructor consent. Repeatable.

GEOG 537. Graduate Cooperative Education. 1-3 Credits.
Practical experience of applying advanced concepts of geography. Experience will vary from student to student and must be coordinated with co-op host. Prerequisite: MS/MA students must have minimum of 12 graduate credits and permission of department chair or co-op coordinator.

GEOG 551. Advanced Human Geography. 3 Credits.
An investigation of an advanced topic in human geography. May be repeated if a different topic is examined. Prerequisite: Instructor consent. Repeatable.

GEOG 570. Web GIS. 3 Credits.
Web GIS is the combination of GIS (Geographic Information Systems) and the world wide web. This advanced course is focused on the ArcGIS Web platform ArcGIS Online and tools such as Story Maps, Web AppBuilder, Mobile GIS, Web GIS Programming and spatial analysis and geoprocessing. Prerequisite: GEOG 474 and GEOG 474L or equivalent. S, even years.

GEOG 571. Python Programming for Geographic Information Systems. 3 Credits.
This advanced GIS course is focused on GIS modeling using Python, an easy-to- learn open-source programming and scripting language. Using the object-oriented programming approach, students learn basic general programmatic concepts as well as the specifics of Python and ArcPy in order to automate basic and advanced geoprocessing tasks in ArcGIS Pro and ArcGIS Online. Prerequisite: GEOG 474 and GEOG 474L or equivalent. On demand.

GEOG 574. Advanced Techniques in Geographic Information Systems. 3 Credits.
An advanced course designed to extend GIS knowledge and experience and to prepare students to become effective GIS analysts. The course follows a hands-on, problem-solving approach that integrates the interests and analytical needs to participating students. Prerequisite: GEOG 474 or an equivalent approved by the department.

GEOG 575. Seminar in Remote Sensing. 3 Credits.
A seminar in the analysis of remote sensing techniques as applied to contemporary research problems in geography. Prerequisite: GEOG 475 or consent of instructor.

GEOG 576. Field Methods and Analysis in Geography. 3 Credits.
An advanced, intensive approach to the measuring and mapping of cultural and physical features of the earth in the field. Familiarization with the practical problems involved in data collection techniques in rural as well as urban areas and transfer of the pattern of phenomena of an area to a scale suitable for mapping.

GEOG 578. Geographic Research and Writing. 3 Credits.
Required of all graduate students. Orientation to methods of research and communication in geography. Emphasis upon research design, identification of bibliographic and geographic source materials, communication skills, and proposal writing. Prerequisite: Graduate standing. S.

GEOG 591. Directed Study in Geographical Problems. 1-4 Credits.
Directed advanced research in a specialized field of geographic study. May be repeated up to a total of 9 credits. Prerequisite: Consent of instructor. Repeatable to 9.00 credits. F,S,SS.

GEOG 597. Graduate Internship. 3 Credits.
The internship is designed to provide GIScience students with opportunities to gain valuable practical experience with an employer by applying their knowledge and skills in geospatial technologies in a business or organizational setting. Students currently employed in a GIS position may elect to use their current position for internship experience in consultation with the faculty internship supervisor. Prerequisite: GEOG 471, GEOG 471L, GEOG 474, and GEOG 474L. Repeatable to 6.00 credits. S/U grading. F,S,SS.

GEOG 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

GEOG 997. Independent Study. 2 Credits.
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GEOG 998. Thesis. 1-6 Credits.
Repeatable to 6.00 credits.

Undergraduate Courses for Graduate Credit

GEOG 421. Selected Topics in Physical Geography. 3 Credits.
An examination of an advanced physical geography topic chosen from field methods, biogeography, human impact on the environment, physiography, or others. Repeatable to nine credits if different topics are examined. Prerequisite: GEOG 121 or consent of instructor. Repeatable to 9.00 credits. On demand.

GEOG 453. Historical Geography. 3 Credits.
Using the spatial approach, landscape change is analyzed over time in various regions of the world using a variety of scales of study. Emphasis is placed upon the relationship of historical geography to historic preservation and tourism. F.

GEOG 457. Urban Geography and Planning. 3 Credits.
This course examines the internal workings of cities from political, economic, and social perspectives. Geographic approaches to urban analysis are discussed, as are various methods for contemporary urban planning. Students learn to view the city as a geographic phenomenon created by human effort. S, odd years.

GEOG 462. Geography of North America II. 3 Credits.
A regional analysis of the physical, cultural, and economic features of a selected region or group of regions within North America. May be repeatable to six credits if a different region is examined. Prerequisite: GEOG 262 or consent of instructor. On demand.

GEOG 463. Regional Geography. 3 Credits.
A regional and topical analysis of the physical and cultural features with emphasis on one continent or region. May be repeated up to nine credits provided different regions and approaches are involved. Repeatable to 9.00 credits. S.

GEOG 471. Cartography and Visualization. 2 Credits.
This course examines the art, science, and technology of cartography and visualization. It familiarizes students with basic cartographic principles and with GIS, both of which are applicable to a wide range of professional fields and academic disciplines. Students learn how maps are designed and used to accurately represent and effectively communicate spatial phenomena and relationships. The course also includes a discussion of selection of proper thematic mapping techniques. Corequisite: GEOG 471L. F.

GEOG 471L. Cartography and Visualization Laboratory. 1 Credit.
Students apply concepts learned in GEOG 471 to produce accurate, appropriate and well-designed maps using GIS software. Lab activities hone the ability of students to be informed producers and consumers of maps and provide hands-on experience that demonstrates how maps function as a communicative visual medium. Corequisite: GEOG 471. F.

GEOG 474. Introduction to Geographic Information Systems (GIS). 2 Credits.
An introductory course that examines the digital representation, manipulation, and analysis of geographic data, with emphasis on the analytical capabilities that GIS brings to bear on the solution of geographic problems. Corequisite: GEOG 474L. F,S.

GEOG 474L. GIS Laboratory. 1 Credit.
Hands-on application of theory and methods associated with digital spatial data representation, manipulation, and analysis. Corequisite: GEOG 474. F,S.

GEOG 475. Digital Image Processing. 3 Credits.
A course focused on the concepts and principles involved in the use of digital remotely sensed data as they are applied to environmental monitoring and natural resource management. Emphasis is placed on algorithm development and 'hands-on' application of digital techniques to select imagery. Prerequisite: GEOG 374 and 374L. S, odd years.

GEOG 476. Selected Topics in Geographic Information Systems. 3 Credits.
An examination of a specific application area or set of techniques in GIS including, but not limited to, Business GIS, Environmental GIS, GIS Databases, GIS Scripting and Web-Based GIS. Repeatable to six credits if different topics are examined. Prerequisite: GEOG 474 and GEOG 474L, or instructor consent. Repeatable to 3.00 credits. On demand.