

Geographical Information Systems

GIS at George Washington University

Our focal GIS & Remote Sensing Courses are as follows:

GEOG 104 – Introduction to Cartography & GIS (Jennings & Cowan)

The objective of this course is to gain an understanding of basic cartographic issues and GIS concepts, and their use in a specific GIS application (ArcGIS 9). This course is directed at students seeking to gain an initial introduction to GIS, including those intending to follow the GIS minor at GWU. This course is roughly fifty percent cartographic principles and fifty percent GIS fundamentals. Lab assignments will constitute twenty percent of the overall grade and are designed to provide the student with a basic software overview and introductory competency.

Prerequisites: There are no prerequisites for this course, but it is strongly suggested that you take Geog 105 – Techniques of Spatial Analysis, in tandem the Geog 104, if you intend to pursue further advanced GIS classes

GEOG 105 – Techniques of Spatial Analysis (Millward)

The primary objective of this course is to familiarize you with basic concepts and methods used in spatial analysis, a field which spans many related disciplines and which brings together many tools for describing and analyzing spatial data. We will learn how to analyze and interpret geographical data, when to use a certain procedure, and how to apply statistics in your own work. The course will begin by reviewing statistical concepts and techniques used in traditional aspatial analysis. You will develop an understanding of some of the limitations associated with spatial data when applying traditional statistical approaches, as well as the challenge of selecting analytical techniques when data are known to be spatially autocorrelated. Techniques and methods that have been designed to handle spatial data will be taught, and include point-pattern analysis and measures of spatial autocorrelation.

GEOG 106 – Intermediate GIS (Engstrom & Rain)

This course aims to provide a comprehensive understanding of the relationship that exists between GIS, Geographic Information Science, Cartography, and Geography. Students will participate in a thorough discussion of the essential components of GIS: data capture, storage, manipulation/analysis, and presentation. More advanced concepts such as the essentials of geospatial databases, georeferencing, geoprocessing, and spatial modeling are explored. Participants are expected to have existing knowledge of the ArcMap software, to meet the demands of more intensive labs work.

Prerequisites: GEOG 104, and GEOG 105

GEOG 121 – Advanced GIS (Cheung)

This upper-division/graduate level course squarely builds upon Geog 105 - Techniques of Spatial Analysis and Geog 106 - Intermediate GIS. During the duration of the program, students will develop an in-depth appreciation for how geographic data and spatial processes present intriguing challenges in a GIS environment. Students will also explore how various GIS approaches and methods are applied to research in both the environmental and social sciences. This is achieved by both intense literature review and as well as hands-on transformation of geographic data to spatial information. Advanced students of GIS must appreciate the integrative nature of geographic information, and how it is linked to other components of GI sciences and technologies, such as remote sensing, global positioning systems, and spatial analysis. Class will explore the expansion of GIS technology (Web GIS and Wireless GIS), and experience the use of various advanced extensions, such as Spatial Analyst, Geostatistical Analyst, Network Analyst, and 3D Analyst.

Prerequisites: GEOG 104, GEOG 105 and GEOG 106

GEOG 107 – Introduction to Remote Sensing (Engstrom)

The objective of this course is to introduce the theoretical, technical and applied aspects of remote sensing as a tool for monitoring and managing earth resources. Particular emphasis is placed on the electromagnetic radiation transfer, and data collection with aerial photographic and satellite sensor systems. Lectures emphasize the theoretical and technical aspects of image acquisition and interpretation. Each lecture is accompanied by an outline covering the general content of the lecture, as well as relevant graphs, references and readings.

Prerequisites: GEOG 105

GIS Minor

Currently the department offers a minor in GIS. Consider this an excellent opportunity for a brilliant career move.

Requirements for this Minor:

All Minor Candidates must complete a minimum of 21 credits of GIS coursework

REQUIRED COURSES (6 Credits)

Geog 01	Introduction to Human Geography (F/S)
Geog 02	Introduction to Physical Geography (F/S)

ANY 4 OF THE FOLLOWING (12 Credits)

Geog 104	Introduction to Cartography and GIS (F/S)
Geog 105	Techniques of Spatial Analysis (F/S)
Geog 106	Intermediate GIS (S)
Geog 107	Introduction to Remote Sensing (S)
Geog 121	Advanced GIS (F)

ANY 1 OF THE FOLLOWING (3 Credits)

Geog 108	Weather and Climate (F)
Geog 110	Climate and Human Ecology (S)
Geog 124	Urban Transportation (F)
Geog 125	Transportation and Communication (S)
Geog 127	Population and Settlement (S)
Geog 132	Environmental Quality and Management (F)
Geog 133	People, Land and Food (F)
Geog 134	Energy Resources (F)
Geog 136	Water Resources (F)
Geog 137	Environmental Hazards (S)
Geog 140	Urban Geography (US focus) (F)
Geog 141	Cities in the Developing World (S)
Geog 145	Cultural Geography (S)
Geog 146	Political Geography (F)
Geog 147	Military Geography (F)
Geog 187	Building Cities (S)

If you would like to explore this opportunity, please contact Dr. David Rain (GIS Minor Advisor) [drain@gwu.edu/994-3966].