



***GEOG 2104 – Introduction to Cartography & GIS (Cowan, Hinton, Wiseman)***

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 10). 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 forty 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 suggested that you take Geog 2105 – Techniques of Spatial Analysis, in tandem with Geog 2104, if you intend to pursue further advanced GIS classes

***GEOG 2105 – Techniques of Spatial Analysis (Cheung, Streletskiy)***

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.

***Prerequisites:*** There are no prerequisites for this course, but it is suggested that you take Geog 2104 – Introduction to Cartography & GIS, in tandem with Geog 2105, if you intend to pursue further advanced GIS classes

***GEOG 2107 – 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 2105 [may be done in tandem with GEOG2107 by permission of instructor]

### **GEOG 3106 – Intermediate GIS (Mann)**

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 2104, and GEOG 2105

### **GIS Minor Elective**

GIS minor students will have the opportunity to choose their advanced class from a series of GIS electives designed to meet the advanced/applied techniques requirements of both the GIS Minor and the graduate GIS Certificate. Course numbers in parentheses, ie (4310), are pending.

These classes are as follows:

GEOG 4307: Digital Image Processing (Spring) - Engstrom

GEOG 4309: GIS for Emergency Management (Fall) - Smith

GEOG 4311: Open Source GIS (Spring) – Cowan & Hinton

GEOG 3196 (4308): Programming for Geographic Applications (Fall) - Mann

GEOG 3196 (4310): Geovizualization and Cartography (Fall) – James

**Prerequisites:** GEOG 3106 for all classes, additionally GEOG 2107 required for GEOG 6307

## 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 18 credits of GIS coursework***

***REQUIRED TECHNICAL COURSES (15 Credits)***

Geog 2104 Introduction to Cartography and GIS (F/S/Summer)

Geog 2105 Techniques of Spatial Analysis (F/S)

Geog 2107 Introduction to Remote Sensing (F)

Geog 3106 Intermediate GIS (F)

GIS Minor Elective class (student's choice) (F/S)

*NOTE: You may not enroll in your Elective class until you have completed the prerequisites.*

In addition, you must take **1** other **Geography** course to complete the final 3 credit requirement. The choice of final course must be discussed with an advisor.

If you would like to explore this opportunity, please contact the GIS Minor Advisors , Dr. Ryan Engstrom [rengstro@gwu.edu] or Mr. Richard Hinton [rhinton@gwu.edu].