

**Hofstra University**  
**Department of Global Studies & Geography**



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# **GEOG 60 – Introduction to Geographic Information Systems**

## **Objectives and Learning Goals**

Geographic Information Systems (GIS) are used to encode, store, analyze, and report spatial data. They link different information technologies such as mapping and database management systems. They also provide a repository for spatial data, which can be constructed, maintained, edited and analyzed. The ability to use spatial information facilitates management and decisions in a wide array of fields and GIS are increasingly being used for practical purposes. They include marketing, resource management, facility location, environmental impact assessment, urban planning, transportation, and tracking crime data, just to name a few.

The general goals of the course are:

- Students will constantly be exposed to cartographic information and will develop map reading skills, ranging from the simple reckoning of locations to the understanding of the spatial structure and process that maps can represent.
- Students will become familiar with standard quantitative and qualitative methods, enabling them to accurately understand the meaning of information and how this information can be used to understand economic and social issues.
- In addition to the ability of understanding and reading maps, students will develop cartography skills and will be able to create maps on their own.
- Students will learn how to use ArcMap GIS software particularly for the purpose of qualitative and quantitative information analysis as well as for cartography. ArcMap will be the main tool in which students will apply the geographical methodology.

## **Requirements**

### **Evaluations**

Since the subject covered has a strong technical content, laboratories are the only forms of evaluation for this course. It is expected that the student will spend a fair amount of time completing labs outside regular class time. Class attendance is also an essential requirement for the successful completion of this course and no substitutes will be accepted. I will consequently fail students if class attendance is insufficient, regardless of performance. Labs obviously focus on the practical aspects of working with geographical information. A total of 100 points can be accumulated in five laboratories of 20 points each.

## Grades

To successfully complete this class, you need to accumulate 45 points:

<b>(A)</b> 90 points and above.	<b>(C)</b> Between 60 and 65 points.
<b>(A-)</b> Between 85 and 90 points.	<b>(C-)</b> Between 55 and 60 points.
<b>(B+)</b> Between 80 and 85 points.	<b>(D+)</b> Between 50 and 55 points.
<b>(B)</b> Between 75 and 80 points.	<b>(D)</b> Between 45 and 50 points.
<b>(B-)</b> Between 70 and 75 points.	<b>(F)</b> Below 45 points.
<b>(C+)</b> Between 65 and 70 points.	

Grades are not negotiable and the only way a grade will be revised is if an error was made in the evaluation process. An A is considered a reward for exceptional work, and as such will not be awarded lightly. Late assignments will be penalized as follows: 10% of the total points for the assignment will be deducted for each day the paper is handed in late (beginning immediately after class on due day). No assignment will be accepted 5 days after the due date. Failure to turn in assignments will adversely affect grades.

If for any reason you are having problems following lectures, cannot cope with the laboratories, or have any other problems with the course, it is your duty to bring these to my attention. I will be more than willing to help you out if you come to me with any course related problems. Any problems not brought to my attention will not be considered as an excuse for poor performance.

## Academic Honesty

Plagiarism is a serious ethical and professional infraction. Hofstra's policy on academic honesty reads: "The academic community assumes that work of any kind [...] is done, entirely, and without assistance, by and only for the individual(s) whose name(s) it bears." Please refer to the "Procedure for Handling Violations of Academic Honesty by Undergraduate Students at Hofstra University" for details about what constitutes plagiarism, and Hofstra's procedures for handling violations.

## Disabilities Policy

If you believe you need accommodations for a disability, please contact Services for Students with Disabilities (SSD). In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, qualified individuals with disabilities will not be discriminated against in any programs, or services available at Hofstra University. Individuals with disabilities are entitled to accommodations designed to facilitate full access to all programs and services. SSD is responsible for coordinating disability-related accommodations and will provide students with documented disabilities accommodation letters, as appropriate. Since accommodations may require early planning and are not retroactive, please contact SSD as soon as possible. All students are responsible for providing accommodation letters to each instructor and for discussing the specific accommodations needed and how they can be best implemented in each course.

For more information on services provided by the university and for submission of documentation, please contact the Services for Students with Disabilities, 212 Memorial Hall, 516-463-7075.

## Outline

### Topic 1 – Introduction to Geographic Information Systems

*Concepts: An overview of GIS and their purpose. Overview of ArcMap and ArcCatalog. Projections.*

*Labs: Familiarization with the ArcMap GIS software. Map projections.*

*Readings: ESRI, Chapters 1 to 4.*

### Topic 2 – Displaying Geographical Data

*Concepts: Symbolizing Features. Classifying features. Labeling features. Joining and relating tables.*

*Labs: Symbolizing. Classification. Labeling.*

*Readings: ESRI, Chapters 5 to 7.*

### Topic 3 – Querying Geographical Data

*Concepts: The spatial query process.*

*Labs: Identifying, selecting, and finding data. Selecting by attribute. Joining and relating tables.*

*Readings: ESRI, Chapters 8 and 9.*

### Topic 4 – Analyzing Geographical Data

*Concepts: Introduction to spatial analysis. Selecting by location. Data preparation and analysis.*

*Labs: Location queries. Calculating attribute values.*

*Readings: ESRI, Chapters 10 to 13.*

### Topic 5 – Cartographic Output

*Concepts: The cartographic message. Map composition. Thematic mapping.*

*Labs: Map templates. Drawing graphics. Map layout and cartographic symbols. Readings: ESRI, Chapters 18 and 19.*

## Bibliography

### Required Reading

Ormsby, T., E.J. Napoleon, R. Burke, C. Groessl and L. Bowden (2010) Getting to Know ArcGIS, Third Edition, Redlands, CA: ESRI Press. ISBN 978-1-58948-260-9.

### Additional Reading

Chang, K.T. (2012) Introduction to Geographic Information Systems, Sixth Edition, New York: McGraw-Hill. ISBN 978-0-07-336931-0.

Demers, M.N. (2008) Fundamentals of Geographic Information Systems, Fourth Edition, New York: Wiley. ISBN 0470129069.