



# Broward Community College

## Course Outline

STATUS:   A  

COMMON COURSE NUMBER:   GIS1042C  

COURSE TITLE:   Introduction to Geographic Information Systems II  

CREDIT HOURS:           3          

**CONTACT HOURS BREAKDOWN:**

Lecture/Discussion           32          

Lab                   32          

Other                           

Contact Hours/Week           4          

**CATALOG COURSE DESCRIPTION:**

Prerequisite: GIS1040C

Corequisite: None

This course will build upon the student's fundamental knowledge of GIS gained in the prerequisite course titled "Introduction to Geographic Information Systems I". The student will learn how to implement geographic concepts in GIS systems. The course will provide the student with the fundamentals of computing and information science systems and cartography. It will introduce the student to the theory and practice of computer-aided cartography. In addition, the student will delve more deeply into data representation, manipulation and presentation.

General Education Requirements - Associate of Arts Degree, meets Area(s):  
 General Education Requirements - Associate in Science Degree, meets Area(s):

**UNIT TITLES:**

1. Representation of Fields and Discrete Objects
2. Populating the GIS
3. Spatial Analysis
4. Implementation of a GIS
5. GIS Data
6. Map as a Graphic Language
7. Visualization
8. Map Editing and Map Design
9. Desktop Cartography
10. Applications and Case Studies

LAST REVIEW   Academic Year 2002-03  

NEXT REVIEW   Academic Year 2007-08

## **I. Course Overview:**

Upon successful completion of this course, the students should be able to implement geographic concepts in GIS systems, represent, manipulate and present data, discuss and apply the fundamentals of computing and information science systems.

## **II. Units:**

### **Unit 1. Representation of Fields and Discrete Objects**

#### General Outcome:

- 1.0 The students should be able to represent data by various methods, explain hierarchies, and describe storage and relationships of discrete objects.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Describe and represent raster data.
- 1.2 Describe and represent vector data.
- 1.3 Describe the topology of geodata and object hierarchies.

## Unit 2. Populating the GIS

### General Outcome:

2.0 The students should be able to sample, exchange, find and convert, generate, access, distribute and utilize data.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Discuss the applications of remote sensing and GPS.
- 2.2 Perform data exchange operations between open GIS platforms.
- 2.3 Find and convert data.
- 2.4 Generate data from existing data.
- 2.5 Access and distribute networked databases.
- 2.6 Utilize metadata.

### Unit 3. Spatial Analysis

#### General Outcome:

3.0 The students should be able to describe relationships within spatial data, generalize spatial data, and explain geostatistics and map algebra.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Generalize spatial data.
- 3.2 Identify and explain geostatistics.
- 3.3 Discuss map algebra.

## Unit 4. Implementation of a GIS

### General Outcome:

4.0 The students should be able to create, manipulate, analyze and validate data from databases.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Plan a GIS project including performing a needs analysis, specifying a GIS, and evaluating a system.
- 4.2 Design a database.
- 4.3 Implement a GIS.

## Unit 5. GIS Data

### General Outcome:

5.0 The students should be able to discuss, access, and utilize various types of geospatial data; transfer between databases; and discuss legal aspects of national and international databases.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Transfer standards between databases.
- 5.2 Discuss national and international data infrastructures.
- 5.3 Discuss legal issues concerning data acquisition and supply.
- 5.4 Utilize market data.
- 5.5 Access WWW and digital libraries.
- 5.6 Identify the types of available demographic data.
- 5.7 Describe sources of population data including the US census and TIGER and identify problems with this data.
- 5.8 Access and utilize health data, transportation networks, and land records.
- 5.9 Utilize natural resource records to compile data for GIS systems.

## Unit 6. Map as a Graphic Language

### General Outcome:

6.0 The students should be able to define maps in the context of language and discuss cartography as a model.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Discuss the various ways maps have been defined.
- 6.2 Define a map in the context of graphic language.
- 6.3 List, define, and describe the various map types.
- 6.4 Define map generalization.

## Unit 7. Visualization

### General Outcome:

7.0 The students should be able to visualize and plan map making for an effective product.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

7.1 Use color as a design tool.

7.2 Utilize various typographies for an effective outcome.

## Unit 8. Map Editing and Map Design

### General Outcome:

8.0 The students should be able to design and edit maps.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

8.1 Discuss the process of traditional map production.

8.2 Perform various map editing procedures.

8.3 Create maps using various map designs.

8.4 Describe major components that should be on every map such as north arrow, scale bar, title, data source, and date.

## Unit 9. Desktop Cartography

### General Outcome:

9.0 The students should be able to create maps using GIS software.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 9.1 Describe the process of desktop cartography.
- 9.2 Describe various input methods while insuring accuracy.
- 9.3 Discuss and make use of the various cartographic capabilities of GIS software.
- 9.4 Create vector based maps.
- 9.5 Create raster based maps.
- 9.6 Describe and make use of new cartographic products.

## Unit 10. Applications and Case Studies

### General Outcome:

10.0 The students should be able to discuss various applications of GIS.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

10.1 Describe how GIS plays a role in the resource management.

10.2 Explain how GIS is used in urban planning and management.

10.3 Apply records and LIS.

10.4 Describe network applications, such as transportation and emergency response.

10.5 Apply environmental modeling.

10.6 Discuss hazards and risk assessment.

10.7 Describe the use of a GIS in marketing, business and recreation.