

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE  
MASTER SYLLABUS

FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEMS  
GIS 1010

**Class Hours: 3.0**

**Credit Hours: 3.0**

**Laboratory Hours: 3.0**

**Date Revised: Fall 02**

NOTE: This course is not designed for transfer credit.

**Catalog Course Description:**

Presents an overview of the GIS profession and the opportunities available in the field. Presents introductory content on typical business and technical applications, data, software and techniques used to accomplish GIS projects. When possible, local GIS professionals present seminars on their work. Students receive hands-on experience with Global Positioning and GIS hardware and software. Students learn the basics needed for advanced GIS courses. This course is also designed for students who want to become generally familiar with GIS technology. Students should have a working knowledge of Microsoft Windows before enrolling in the course.

**Entry Level Standards:**

The student should be able to effectively communicate with instructor and peers, complete assignments according to instructor specifications, and read and write at the required level.

**Prerequisites:**

None

**Corequisites:**

None

**Textbook(s) and Other Course Materials:**

*Geographic Information Systems and Science*. Longley, Goodchild, Maguire, and Rhind. Wiley and Company, 2001.

*Getting to Know ArcGIS Desktop*. Ormsby, Napoleon, Burke, Groessl and Feaster, ESRI Press, 2001.

**I. Week/Unit/Topic Basis:**

<b>Week</b>	<b>Topic</b>
1	Introduction to GIS Concepts & Terminology
2-4	Global Positioning Technology, Maps and Navigation
5-6	Vector GIS and Databases

7-8	Raster GIS, Images and Photogrammetry
9-10	GIS Software Tools and Systems
11	Data Sources and Data Quality
12	Business GIS and Location Based Services
13-14	GIS Products: Cartography, Web GIS, and Customization
15	Acquiring GIS Skills and Jobs
16	Final Exam

## II. Course Objectives\*:

- A. Accessing spatial data sources, i.e., maps, land records, etc. I, III
- B. Creating digital spatial data, i.e., digitizing maps. I, II
- C. Managing data by editing & validating digital libraries, i.e., land & tax records. I, II, IV
- D. Analyzing data, i.e., using address matching to convert postal addresses and/or zip codes to geographic coordinates, thus creating new data. I, IV
- E. Displaying analysis results in the form of maps, tables, & graphs. I, III, IV

\*Roman numerals after course objectives reference goals of the GIS program.

## III. Instructional Processes\*:

Students will:

1. Explain the relationships among Geographic Information System (GIS), Computer Assisted Cartography (CAC), and Computer Assisted Drafting (CAD). *Technological Literacy Outcome*
2. Use critical thinking to solve problems dealing with data collection and analysis in class projects. For example, converting different GIS layers to the same projection and coordinate system. *Problem Solving and Decision Making Outcome, Numerical Literacy Outcome*
3. Use spatial elements, measurements, locations and references to develop graphic and numerical awareness of the real world. Understand how information in the form of maps and numbers connect to the physical world. *Numerical Literacy Outcome*
4. Understand the functions of GIS data input, input devices, problems, and transformations that take place during data input. *Numerical Literacy Outcome*
5. Be familiar with the basic procedures for digitizing and the overall quality of GIS databases. *Numerical Literacy Outcome, Problem Solving and Decision Making Outcome*
6. Use GIS software to analyze specific data of geographic areas familiar to the student. *Technological Literacy Outcome, Active Learning Strategies*
7. Participate in open discussions regarding the strengths and weaknesses of GIS procedures and what improvements might be made in future releases. *Active Learning Strategies,*

*Communication Outcome, Transitional Strategy*

8. Use the Internet and related tools to gather information and communicate effectively between the instructor, other students. *Technological Literacy Outcome*

\*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

**IV. Expectations for Student Performance\*:**

Upon successful completion of this course, the student should be able to:

1. Connect to remote computers, locate desired data sets, and retrieve data of various formats over the Internet or from archive media. A
2. Locate demographic data for use in a GIS. A
3. Acquire land records from a variety of sources in different formats and combine these into a comprehensive and accurate map. A
4. Plan GPS data collection for GIS applications. B
5. Make wise choices between data collection and GIS analysis methods. B
6. Use on-screen digitizing with images scanned from maps, photographs, or satellite data if suitable. B
7. Understand the different types of devices for general input of any data into a computer. C
8. Determine whether raster or vector GIS will be used. C
9. Utilize database for editing entity and attribute errors. C
10. Apply the ideas of the mean, median, mode, variance and standard deviation to data. C
11. Evaluate the accuracy of both base files and address files and standardize address files. C
12. Evaluate non-matches and understand the rematch process. D
13. Use knowledge of map elements, map types, and proper cartographic conventions to guide map design decision-making. E
14. Operate plotter/printers to produce high quality maps. E

\*Letters after performance expectations reference the course objectives listed above.

**V. Evaluation:**

A. Testing Procedures:

Exams will be given that covers specific modules in the course. A comprehensive final exam will be given during final exam week.

B. Laboratory Expectations:

Class Evaluation: A class notebook will be maintained and turned in at the final exam period.

Final class grade will be calculated as a percentage of numeric scores of elements assigned in class and laboratory. A class participation grade will be given reflecting the level at which the student regularly attends class, participates in class discussions, assists others in the learning process and provides content input to the class.

C. Field Work:

GPS Skills: Individual exam to demonstrate competence in using GIS software and associated laboratory equipment.

GIS Software Skills: Individual exam to demonstrate competence in using GIS software and associated laboratory equipment.

Communication Skills: Individual evaluations to demonstrate competence in written and oral communication.

D. Grading Scale:

Values associated with classroom evaluation elements are:

Module tests: 100 points each

Final Exam: 200 points

Class participation: 100 points

Class notebook: 100 points

Values associated with laboratory evaluation elements are:

GPS Skills: 100 Points

GIS Software Skills: 100 points

Communication Skills: 100 points for each competence assignment

A	90 – 100
B+	86 - 89
B	80 – 85
C+	76 - 79
C	70 - 75
D	60 - 69
F	< 60

**VI. Policies:**

A. Attendance Policy:

Pellissippi State Technical community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Other Policies:

GIS 1010 is a hands-on course in which the classroom and laboratory experience cannot be re-created for students missing a class period. Regular attendance and active participation is essential to successful completion of the course.