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 00

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:

None

Prerequisites/Corequisites:

None

Textbook(s) and Other Reference Materials Basic to the Course:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to GIS Concepts &amp; Terminology</td>
</tr>
<tr>
<td>2</td>
<td>Spatial Analysis</td>
</tr>
<tr>
<td>3</td>
<td>Mapping &amp; Cartography</td>
</tr>
<tr>
<td>4-8</td>
<td>Data Input, Storage, &amp; Editing / Mid-term Exam</td>
</tr>
<tr>
<td>9-10</td>
<td>Measuring &amp; Classifying Data</td>
</tr>
<tr>
<td>11</td>
<td>Statistical Surfaces</td>
</tr>
<tr>
<td>12</td>
<td>Spatial Arrangement</td>
</tr>
<tr>
<td>13</td>
<td>Variable Overlay</td>
</tr>
<tr>
<td>14</td>
<td>Cartographic Modeling</td>
</tr>
</tbody>
</table>
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, Edge Matching of two or more adjacent coverage areas could be used to permit the analysis of a large study area. 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 Microsoft Word to generate a report documenting one or more ARCView commands. 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 electronic mail to communicate effectively between the instructor, other students, and information gathering. 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 a digitizing project or any GIS project. B

5. Make wise choice between the digitizing modes, as well as to perform post-digitizing operations such as edge-matching adjoining map sheets, converting to raster structures if necessary, add topology and labels either as part of the digitizing procedure or in post-processing. B

6. Use on-screen digitizing with images scanned from maps, photographs, or satellite data if suitable. B

7. Classify & label each feature and then identifying specific feature attributes. B

8. Work with a variety of systems and methods to manipulate CAD data and then determine the most appropriate methods of converting that data to a GIS. B

9. Understand the different types of devices for general input of any data into a computer. C

10. Determine whether raster or vector GIS will be used. C

11. Determine what and how much of the data to input. C

12. Utilize database for editing entity, attribute, and agreement errors. C

13. Join adjacent coverage areas by edge matching. C

14. Integrate knowledge of buffers to perform high level tasks, and post-buffer analyses. D

15. Integrate knowledge of overlay operations. D

16. Apply the ideas of the mean, median, mode, variance and standard deviation to data. D

17. Evaluate the accuracy of both base files and address files and standardize address files. D

18. Evaluate non-matches and understand the rematch process. D

19. Perform a basic reclassification analysis using attribute information provided in the address file. D

20. Design effective graphics for multiple variables. E

21. Incorporate logical color schemes for the display of each variable. E

22. Use knowledge of map elements, map types, and proper cartographic conventions to guide map design decision-making. E

23. Operate plotter/printer hardware to produce professional maps. E

24. Transform graphic files into a variety of different formats for different kinds of presentations. E
25. Make a complete presentation utilizing graphics from several different sources. E

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

V. Evaluation:

A. Testing Procedures: 70% of grade

Two exams will be given during the semester with each counting for 30% of the total grade. Quizzes will be given at the discretion of the instructor counting for 10% of the total grade.

Mid-term exam: 30% of total grade
Final exam: 30% of total grade
Quizzes: 10% of total grade

B. Laboratory Expectations: 30% of grade

Students will be evaluated on the correctness of their drawings/work and on final set of working drawings of a project.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90 – 100</td>
</tr>
<tr>
<td>B+</td>
<td>86 - 89</td>
</tr>
<tr>
<td>B</td>
<td>80 – 85</td>
</tr>
<tr>
<td>C+</td>
<td>76 - 79</td>
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<tr>
<td>C</td>
<td>70 - 75</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69</td>
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<tr>
<td>F</td>
<td>&lt; 60</td>
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VI. Policies:

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.