PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

ADVANCED GIS
SURV 2317

Class Hours: 2.0 Credit Hours: 3.0
Laboratory Hours: 2.0 Date Revised: Fall 2013

Catalog Course Description:

Advanced instruction in the use of commercial GIS software (ArcGIS) and associated tools used in various courses and GIS projects. Introduces the concept of work automation through models, VB scripts and field calculations. Presents methods that enable a GIS professional to register and rectify raster data for use in GIS projects. Students perform network and advanced spatial analysis. Students also are trained to use 3D tools to visualize GIS data.

Entry Level Standards:

Students should have knowledge and experience working in the Windows operating system environment, including the use of the Microsoft Office software components. Students should have basic experience with ArcGIS® software. Students should be able to effectively communicate with instructor and peers, complete assignments according to instructor specifications and have mathematics, writing, and verbal skills at the college level.

Prerequisites:

SURV 2200

Corequisites:

None

Textbook(s) and Other Course Materials:

GIS Fundamentals, Paul Bolstad, Eider Press. Third Edition

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Map projection, coordinate systems and map reading skill review</td>
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<tr>
<td>2</td>
<td>Using existing digital data for base maps</td>
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<tr>
<td>3</td>
<td>Registration and geometric correction of raster data</td>
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<td>4</td>
<td>Data models and working with geodatabases</td>
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<td>5</td>
<td>Editing, topology and digitizing map data</td>
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<td>Data standards and quality; metadata</td>
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6  Exam 1  
   ArcGIS raster tools & raster analysis  
7  Map overlay and geoprocessing; spatial analyses  
8  Network analysis  
9  Exam 2  
   Terrain analysis  
10  Terrain analysis  
11  3D data and visualization  
12  3D analysis  
13  3D analysis  
14  Individual or group project presentation  
   Software skills exam  
15  Final Exam Period  

II. Engineering Technology General Outcomes (Educational objectives)  

I  Apply basic engineering theories and concepts creatively to analyze and solve technical problems  
II  Utilize with a high degree of knowledge and skill equipment, instruments, software, and technical reference materials currently used in industry.  
III  Communicate effectively using developed writing, speaking, and graphics skills.  
IV  Assimilate and practice the concepts and principles of working in a team environment.  
V  Obtain employment within the discipline or matriculate to a four year program in engineering or industrial technology  

III. Engineering Technology Concentration Competencies*  

Students will:  

A  Apply the knowledge, techniques, skills, and modern tools for the concentration of study to specifically defined engineering technology activities  
B  Demonstrate the knowledge of mathematics, science, engineering and technology to engineering technology problems using developed practical knowledge  
C  Conduct and report the results of standard tests and measurements, and conduct, analyze and interpret experiment or project results  
D  Function effectively as a member of a technical team  
E  Identify, analyze and solve specifically defined engineering technology-based problems  
F  Employ Written, oral and visual communication in a technical environment
At the program level all 6 competencies apply to roman numerals I – V of the Engineering Technology General Outcomes (Educational objectives) listed above.

IV. Course Goals*:

The course will

1. Build the skills to effectively and efficiently use the target software tools. A, B, C
2. Develop student's ability to select the most appropriate software tools to complete a GIS project. A, B, C, E
3. Develop understanding of the relationship between GIS analysis and database management. A, B, C, E, F

*Capital letters after course goals reference the competencies of the Engineering Technology concentrations listed above.

V. Expected Student Learning Outcomes*:

a. Demonstrate effective and efficient use of several GIS software tools. 1
b. Connect to remote computers, locate desired data sets, and retrieve data of various formats over the Internet or from archive media. 1, 2, 3
c. Acquire land records from a variety of sources in different formats and combine these into a comprehensive and accurate map. 1, 2, 3
d. Convert data from a different GIS format. 1
e. Understand the use of Meta data and be able to document it. 1
f. Create a new GIS attribute table and make field calculations. 1
g. Rectify a raster image. 1
h. Create vector data by digitizing from a background map or raster image. 1, 3
i. Use network and path analysis tools with raster and vector data. 1
j. Use 3D tools to visualize raster and vector data. 1, 2
k. Create a complex layout and print on large format printer. 1

* Numbers after Expected Student Learning Outcomes reference the course goals listed above.

VI. Evaluation:

A. Testing Procedures: 45 - 50% of grade.

Exams:
Three exams will be given. Exams are true-false, multiple choice, matching, short answer/essay.
When a student misses an exam due to illness or any other unforeseen circumstance, he must contact the instructor immediately upon return and make-up the exam within one week.
For scheduled absences (appointments, military duty etc.), arrangements must be made with the instructor before the absence.
B. Laboratory Expectations: ___35___% of grade

Each student is expected to complete all laboratory and online course assignments.
GIS Software Skills: There will be individual exam(s) to demonstrate competence in using GIS software.

C. Field Work: ___0___% of grade

Students may be required to collect GPS and/or attribute data in the field to be used in a laboratory exercise or project.
This is part of the laboratory expectations.

D. Other Evaluation Methods: ___15 - 20___% of grade

Individual or small team project, presentation and report. 10 - 15%
Class Participation 5%

E. Grading Scale:

Grades are based on the following:
90 - 100  A
85 - 89  B+
80 - 84  B
75 - 79  C+
70 - 74  C
60 - 69  D
Below 60  F

VII. Policies: Policies (e.g., attendance, academic and classroom misconduct) should be consistent with policies stated in the current College catalog.

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning 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 Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:
- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or
computerized services, without proper documentation of the original source.

- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one’s own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by sending email to disabilityservices@pstcc.edu, or visiting Goins 127, 132, 134, 135, 131. More information is available at http://www.pstcc.edu/sswd/.

D. Other Policies:

Use of Equipment:
Any act of misuse, vandalism, malicious or unwarranted damage or destruction, defacing, disfiguring, or unauthorized use of property/equipment belonging to Pellissippi State is subject to disciplinary sanction.