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

Catalog Course Description:

This course covers survey positioning techniques that require higher accuracy or are used in special situations. Discussion will be limited to GPS techniques. The field techniques and relevant computations will be introduced and practiced.

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 also have the ability to use a standard keyboard and maintain a rate of 10 words per minute. Students should also have mathematics, writing, and verbal skills at the college level.

Prerequisites:

SURV 2550 or Surveying experience and instructor approval

Textbook(s) and Other Course Materials:

*GPS for Land Surveyors, 3rd Edition, Jan Van Sickle, PLS, CRC Press*

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Textbook References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Course objectives and class conduct &amp; Review of Geodetic datums and Coordinates Systems</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>2</td>
<td>Review of basics of control surveys</td>
<td>Class notes</td>
</tr>
<tr>
<td>3</td>
<td>Satellite positioning and GP Satellite Orbits, Ephemeris and Almanac</td>
<td>Chapter 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class Notes</td>
</tr>
<tr>
<td>4</td>
<td>GPS Satellite Signal Structure</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>5</td>
<td>Surveying with GPS GPS Field Techniques</td>
<td>Chapter 4, p.108-120</td>
</tr>
<tr>
<td>6</td>
<td>GPS Hardware and Processing Software GPS Survey Planning and Specifications</td>
<td>Chapter 4, p.91-108</td>
</tr>
<tr>
<td>7</td>
<td>Geodetic Control by GPS GPS Field Observations</td>
<td>Chapter 7</td>
</tr>
</tbody>
</table>
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. Familiarize the students with equipment, field methods, and data processing in GPS positioning techniques. A, B & D
2. Gain further knowledge of geodetic concepts such as geodetic datums and coordinate systems. A, B, D & E
3. Utilize least squares adjustment techniques. A, B, D & E

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

V. Expected Student Learning Outcomes*:

Students will be able to:

a. Explain the theory of Global Positioning Technology. 1, 2 & 3
b. Set up a mapping grade GPS to collect autonomous data. 1 & 2
c. Post process GPS data. 1 & 2
d. Set up a survey grade GPS to collect point locations accurate to 0.1 meter. 1 & 2
e. Collect road centerline data using an offset. 1 & 2
f. Collect point data using a laser attachment to a GPS. 1 & 2
g. Explain how GPS signals can be used to synchronize computer networks. 1 & 2
h. Use a survey grade GPS system to collect a Triangular Irregular Network (TIN) data set. 1 & 2

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

VI. Evaluation:

A. Testing Procedures: 65% of grade

Two tests will be administered counting for approximately 65% of the final grade.

B. Laboratory Expectations: 35% of grade

Students will be assigned group and/or individual projects. The ability to work with others, the ability to make efficient use of equipment, and the level at which students perform will contribute to the grade.

C. Field Work:

N/A

D. Other Evaluation Methods:
E. Grading Scale:

- 90 - 100 A
- 80 - 89 B
- 70 - 79 C
- 60 - 69 D
- Below 60 F

VII. Policies:

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:

**Safety and Equipment Abuse:**
Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury could result in automatic failure of the course.