

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**SURVEYING PRINCIPLES W/LAB
CET 1210**

Class Hours: 3.0

Credit Hours: 5.0

Laboratory Hours: 6.0

**Date Revised: Spring
02**

NOTE: This course is designed for transfer credit.

Catalog Course Description:

The basic theory and applications of measurement with steel tape, EDM, transit, level, and total station. Topics include traverse computations, profile leveling, datums, mapping, profiles, and field notes.

Entry Level Standards:

Students must be adept in applying their background in trigonometry and geometry to the solution of surveying tasks. They should be thorough and neat in their record keeping and willing to work in teams. Must have completed DSPM 0850 or have instructor approval.

Prerequisites:

None

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

Text:

Surveying, Jack C. McCormac, Prentice-Hall Publishing Co., 4th edition.

Reference:

Surveying Practice, Phillip Kissam

Surveying, Charles Breed

Other:

- Field Note Book
- Scientific Calculator
- Paper - Pencil
- Flashlight (night students only)

I. Week/Unit/Topic Basis:

Week	Topic
1	Lecture: Introduction Lab: Definitions & History
2	Lecture: Definitions & History; Types of Surveys; Field Notes Lab: Error Theory

- | | |
|----|--|
| 3 | Lecture: Math Review; Accuracy/Precision & Error
Lab: Pacing; Intro to Steel Tape |
| 4 | Lecture: Taping and Chaining
Lab: Taping |
| 5 | Lecture: Tape Corrections; EXAM 1
Lab: Measuring Angles with a Steel Tape |
| 6 | Lecture: Levels and Leveling
Lab: Diff Leveling - H.L. |
| 7 | Lecture: Levels and Leveling
Lab: Diff Leveling - H.L. |
| 8 | Lecture: Levels and Leveling; EXAM 2
Lab: Diff Leveling - H.L. |
| 9 | Lecture: Intro to Angular Meas.; Transits and Theodolites
Lab: Diff Leveling - A.L. |
| 10 | Lecture: Errors in Ang. Meas.; EXAM 3
Lab: Diff Leveling - A.L. |
| 11 | Lecture: Traverse Calculations
Lab: Traverse (Transit) |
| 12 | Lecture: Area Calculations
Lab: Traverse (Transit) |
| 13 | Lecture: Misc. Traverse Calc.
Lab: Traverse (Theodolite) |
| 14 | Lecture: Misc. Traverse Calc.
Lab: Traverse (TS) |
| 15 | Lecture: Misc. Traverse Calc.
Lab: Lab Final |
| 16 | FINAL EXAM |

II. Course Objectives*:

- A. Understand the common sources of error in surveying measurements and properly minimize them through calculations or field procedure. II,IV
- B. Accurately record all survey data. I,II
- C. Accurately record and calculate all survey data. II,III
- D. Properly use surveying equipment. III,IV
- E. Make precise measurements in the field through proper field procedure. III,IV

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

III. Instructional Processes*:

Students will:

1. Actively listen to class lectures and participate in class activities that develop and reinforce comprehension of the theories, concepts, principles and applications of distance measurement using surveying instruments. *Communication Outcome, Problem Solving & Decision Making Outcome, Active Learning Strategies*
2. Observe class demonstrations on the proper care and use of surveying equipment and then integrate cognitive and manipulative skills to successfully complete laboratory assignments. *Problem Solving & Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*
3. Work individually and in teams to complete lab assignments related to the theories, concepts and principles covered in the lecture portion of the course. *Communication Outcome, Problem Solving & Decision Making Outcome, Information Literacy Outcome, Active Learning Strategies*
4. Keep accurate, complete and neat field notes for all laboratory assignments. *Communication Outcome, Active Learning Strategies*
5. Collect, analyze and tabulate data in an orderly format using EXCEL Spreadsheets, WordPerfect/Word or other appropriate software. *Communication Outcome, Problem Solving & Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Active Learning Strategies, Transitional Strategies*

*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. Differentiate between accuracy and precision. C
2. Calculate the accuracy of field measurements. B,C
3. Calculate the precision of field measurements. A,B,D,E
4. Identify systematic errors for each type of equipment. A
5. Identify accidental errors for each type of equipment. A
6. Identify common human errors and how to avoid them. A
7. Properly record all field data. B
8. Measure horizontal distances, within acceptable limits of precision, by pacing, use of steel tape, and stadia. B,D,E
9. Calculate the appropriate corrections for measurements made with a steel tape. A,C,D
10. Measure vertical distances, within acceptable limits of precision, by differential leveling with a hand level, dumpy level and an automatic level. B,D,E
11. Measure vertical and horizontal angles, within acceptable limits of precision, using a transit, theodolite and a total station. C,D,E

12. Precisely measure a traverse. C,D,E
13. Accurately calculate latitudes, departures and areas of traverses. C
14. Adjust latitudes and departures by a compass or transit rule. C
15. Compute traverse areas by more than one method. C
16. Precisely measure and draw a profile. C,D,E

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

V. Evaluation:

A. Testing Procedures:

Four examinations are scheduled. They will be True/False, Multiple Choice, Matching, Short Answer Essay and Problem Solving.

Examinations will normally be given as scheduled. Should a student have a planned vacation, operation, etc. occur during a scheduled exam, every effort should be made to take the exam prior to the scheduled absence. When a student misses an exam due to illness, he must contact the instructor immediately upon return and make-up the exam within one week.

There will be a lab field final - no make-up.

B. Laboratory Expectations:

Quizzes:

Quizzes may be given by the instructor. Most quizzes will be un-scheduled and randomly given. They cover the previous sessions materials or the reading assignment for that day. There is no make-up or extra credit given for quizzes missed.

Homework:

Students may also be required to hand in answers to select questions at the end of each chapter or other appropriate homework at the instructor's discretion. All written assignments must be handed in on 8 1/2 x 11" engineering notepad paper, paper with smooth edges, or forms provided by your instructor.

All written assignments will be assessed a 10% penalty for each school day it is late.

All student work submitted for evaluation may be retained by the instructor.

C. Field Work:

N/A

D. Other Evaluation Methods:

A subjective evaluation based on attendance, classroom participation and attitude may be included.

E. Grading Scale:

CLASSROOM (55-60%)

Final grades will be computed from the grades obtained on homework, quizzes and examinations as follows:

Quizzes & Homework = 20% - 25%

Examinations = 15% - 25% Each

LAB (40-45%)

Final grades will be determined by grades obtained on field exercises. Each exercise is graded

on completeness of field data, precision of field measurements, accuracy of calculations and graphic representation of data.

Attendance/Equipment Usage 15%-20%

Computations and drawings 15%-20%

Field Notes 40%-50%

Lab Final 20%

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

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 (Pellissippi State Catalog). Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

It is the student's responsibility to attend every scheduled class activity on time.

Students are responsible to get assignments missed and to make-up any work missed during an absence.

B. Academic Dishonesty:

To use any form of unauthorized aid (notes, text, etc.) during a quiz or obtain any form of help from another student during testing is considered a form of cheating. Any time any form of cheating is observed the student will receive a 0 on that quiz or test.

C. Other Policies:

Dress: You will be doing most field work outside. You will be walking in tall grass, mud, etc. Dress appropriate for the weather. Shirts (no tank tops) and shoes must be worn at all times. Shorts may be worn during hot weather.