

**SURV 60 Course Outline as of Spring 2023****CATALOG INFORMATION**

Dept and Nbr: SURV 60 Title: INTRO PLANE SURVEYING

Full Title: Introduction to Plane Surveying

Last Reviewed: 1/25/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Introduction to the principles and practice of plane surveying, including measurements for distance, direction, elevation and position, topographic and planimetric mapping, and use and care of surveying equipment.

**Prerequisites/Corequisites:****Recommended Preparation:**

Course Completion of APTECH 90A and APTECH 90B; OR Course Completion or Concurrent Enrollment in APTECH 191 OR MATH 27

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Introduction to the principles and practice of plane surveying, including measurements for distance, direction, elevation and position, topographic and planimetric mapping, and use and care of surveying equipment. (Grade Only)

Prerequisites/Corequisites:

Recommended: Course Completion of APTECH 90A and APTECH 90B; OR Course

Completion or Concurrent Enrollment in APTECH 191 OR MATH 27

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 2015	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Describe the concepts of plane surveying, including the Public Land Survey System (PLSS).
2. Properly set up and operate plane surveying equipment.
3. Interpret and record data and field notes.
4. Analyze and compute survey and engineering findings.

### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Define the different types of land surveying and their uses.
2. Summarize the proper procedures and use of surveying equipment used in this course.
3. Prepare proper surveying notes and information.
4. Perform surveying computations involving angles, directions, distances, areas, volumes, and vertical and horizontal positions.
5. Calculate horizontal measurements by manual and electronic methods.
6. Determine the elevation difference between points using multiple survey leveling methods.
7. Lay out, measure, analyze and adjust level runs, field traverses and topographic side shots.
8. Compute direction of a line from field data and record data using magnetic and geodetic information.
9. Compute the relative position of points by traversing.
10. Calculate basic curve data and lay out basic horizontal curves.
11. Prepare a topographic map from surveying data and information.
12. Identify the characteristics of and summarize basic procedures used in the PLSS.

### **Topics and Scope:**

- I. Introduction to Plane Surveying
  - A. Procedures

- B. Equipment
- C. Units of measure
- II. Field Notes: Preparation and Use of Field Notes
  - A. Purpose and preparation
  - B. Proper composition in the field
  - C. Office use of field notes
- III. Land Surveying and Measurement Error
  - A. Basic error specification and determination
  - B. Basic error management and correction
- IV. Leveling
  - A. Theory
  - B. Equipment
  - C. Vertical datums
  - D. Process
  - E. Computations
- V. Distance Measurement
  - A. Theory
  - B. Process
  - C. Horizontal datums
    - 1. North American Datum 1927 (NAD 27)
    - 2. North American Datum 1983 (NAD 83)
  - D. Methods
    - 1. Taping
    - 2. Electronic
- VI. Horizontal Curves
  - A. Alignment geometry and basic calculations
  - B. Defining and calculating basic curve elements
  - C. Layout
- VII. Vertical Curves
  - A. Alignment geometry and basic calculations
  - B. Defining and calculating vertical curve elements
  - C. Layout
- VIII. Electronic Instruments and Electronic Measurements
  - A. History of survey measurement equipment
  - B. Use and care of electronic measurement equipment
- IX. Traversing
  - A. Procedures
  - B. Computations and adjustments
  - C. Computing area
  - D. Field notes
- X. Mapping Surveys
  - A. Types and methods
  - B. Mapping and simple plat preparation
- XI. Introduction to PLSS

All topics are covered in the lecture and lab portions of the course.

### **Assignment:**

Lecture-Related Assignments:

- 1. Reading assignments (1-2 chapters per week)
- 2. Homework problem sets (10-20)

3. Exams (3-5)
4. Final exam

Lab-Related Assignments:

1. Weekly field exercises, performance evaluations, and reports

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Reports

Writing  
5 - 15%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problem sets, field exercises and reports

Problem solving  
15 - 25%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Field exercises, performance evaluations

Skill Demonstrations  
30 - 40%

**Exams:** All forms of formal testing, other than skill performance exams.

Exams and final exam

Exams  
25 - 35%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Class participation

Other Category  
5 - 10%

**Representative Textbooks and Materials:**

Elementary Surveying: An Introduction to Geomatics. 15th ed. Ghilani, Charles. Pearson. 2018  
Instructor-prepared materials