

**CATALOG INFORMATION**

Dept and Nbr: CEST 55

Title: CONTROL/ASTRONOMY

Full Title: Principles and Applications of Control & Astronomic Surveys

Last Reviewed: 8/23/2004

| Units   |      | Course Hours per Week |      | Nbr of Weeks | Course Hours Total |       |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 2.00 | Lecture Scheduled     | 3.00 | 8            | Lecture Scheduled  | 24.00 |
| Minimum | 2.00 | Lab Scheduled         | 3.00 | 4            | Lab Scheduled      | 24.00 |
|         |      | Contact DHR           | 0    |              | Contact DHR        | 0     |
|         |      | Contact Total         | 6.00 |              | Contact Total      | 48.00 |
|         |      | Non-contact DHR       | 0    |              | Non-contact DHR    | 0     |

Total Out of Class Hours: 48.00

Total Student Learning Hours: 96.00

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: CET 55

**Catalog Description:**  
Principles and applications of control surveys, state plane coordinate systems and global positioning systems, including methods of astronomical observations, G.P.S. technology and observations, calculations and computations relating to control survey networks.

**Prerequisites/Corequisites:**  
CEST 50B (formerly CET 50B) or equivalent with a "C" or better.

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Principles and applications of Control and Astronomic Surveys. Use of Global Positioning Systems, P.C. computer software in data collection, adjustments and design. Methods of astronomical observations, G.P.S. technology and observations, calculations and computations relating to control survey networks including state plane coordinate systems. (Grade Only)  
Prerequisites/Corequisites: CEST 50B (formerly CET 50B) or equivalent with a "C" or better.

Recommended:  
 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>          | <b>Effective:</b>    | <b>Inactive:</b>    |
| <b>CSU GE:</b>       | <b>Transfer Area</b> | <b>Effective:</b>    | <b>Inactive:</b>    |
| <b>IGETC:</b>        | <b>Transfer Area</b> | <b>Effective:</b>    | <b>Inactive:</b>    |
| <b>CSU Transfer:</b> | Transferable         | Effective: Fall 1981 | Inactive: Fall 2011 |
| <b>UC Transfer:</b>  |                      | Effective:           | Inactive:           |

**CID:**

**Certificate/Major Applicable:**  
 Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

The student will:

1. Identify types of control surveys and their applications.
2. Identify the classes of triangulation, trilateration and traverse control surveys.
3. Identify and demonstrate the appropriate use of global positioning system equipment for data collection.
4. Calibrate and adjust surveying equipment for control surveys.
5. Determine state plane coordinates, ground and grid distances, geodetic and grid azimuths with a control network.
6. Using appropriate field procedures, complete a horizontal and vertical control network by conventional and G.P.S. techniques.
7. Compile and adjust collected data for control surveys and determine the accuracy and precision necessary for the different types of control surveys.
8. Determine the direction of lines by Astronomical Observations.

### **Topics and Scope:**

1. Types and classes of Control surveys.
2. Horizontal and vertical control networks, strength of figures, distance, angle and direction determination, calibration and adjustments.
3. State Plane Coordinate systems, computation of lines and coordinates.
4. Field procedures for horizontal and vertical control using global positioning system equipment and P.C. software applications.
5. Use of Astronomic observations for survey control.
6. Accuracy and precision of control networks.

## Assignment:

1. Applications of control surveys and their classifications.
2. Adjustments of horizontal and vertical control surveys.
3. Use of global positioning system equipment for data collection.
4. Calibrate and adjust surveying equipment for control surveys.
5. Determining state plane coordinates, ground and grid distances, geodetic and grid azimuths with a control network.
6. Using appropriate field procedures, complete a horizontal and vertical control network by conventional and G.P.S. techniques.
7. Compile and adjust collected data for control surveys and determine the accuracy and precision necessary for the different types of control surveys.
8. Determine the direction of lines by Astronomical Observations.

## 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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing  
0 - 0%

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

Field work, Lab reports, Exams

Problem solving  
25 - 35%

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

Field work, Performance exams

Skill Demonstrations  
25 - 45%

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

Multiple choice, Matching items, Completion,  
COMPUTATIONAL

Exams  
15 - 30%

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

Writing Assignments

Other Category  
5 - 10%

## Representative Textbooks and Materials:

Caltrans Surveying Manual - State of California, Department of Transportation.

The California Coordinate System of 1983, a Practical Guide - Vincent J. Sincek

Projection Tables for State Plane Coordinates, CCS29 - State of California, Department of Transportation

Manufacturers Instructional manuals for G.P.S. equipment and adjustment software