

**SURV 53 Course Outline as of Spring 2005****CATALOG INFORMATION**

Dept and Nbr: SURV 53 Title: RT SURVEY &amp; DESIGN

Full Title: Route Surveying &amp; Design

Last Reviewed: 12/13/2021

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	17.5	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: CEST 53

**Catalog Description:**

Route surveying methods and design. Geometric design and construction staking of transportation routes. Use and care of electronic surveying equipment, computers, data collectors, and introduction to photogrammetry, and global positioning systems.

**Prerequisites/Corequisites:**

Course Completion of SURV 51 ( or CEST 50B or CET 50B)

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

Description: Route surveying methods and design. Geometric design and construction staking of transportation routes. Use and care of electronic surveying equipment, computers, data collectors. Introduction to photogrammetry and global positioning systems. (Grade Only)

Prerequisites/Corequisites: Course Completion of SURV 51 ( or CEST 50B or CET 50B)

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>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course, the students will be able to:

1. Develop a route location for a transportation project.
2. Summarize the proper use of the total station and data collector software and hardware.
3. Perform a field survey for control, topographic and planimetric surveys.
4. Prepare maps, plats and drawings from field data.
5. Prepare a photogrammetric surveying layout.
6. Perform complex computations related to photogrammetric surveys, right of way acquisition surveys, roadway alignments, earthwork volumes, slope staking, and global positioning surveys.
7. Design and lay out roadways using civil and surveying CAD software/hardware and surveying equipment.
8. Perform a field survey to slope stake a roadway.
9. Compute earthwork and other construction volumes.
10. Prepare route surveying documentation for different types of projects.

### **Topics and Scope:**

- I. Route Location Process
- II. Control Surveys
- III. Data Collectors
- IV. Photogrammetry
- V. Highway Geometrics
- VI. Highway Design and Layout
- VII. Determining Construction Quantities
- VIII. Slope Staking
- IX. Introduction to GPS (Global Positioning System)

## Assignment:

Assignments 3-8 have a problem solving homework component and a skills lab component.

1. List and identify the steps in developing a route location and give illustrative examples of each step.
2. Compute the position of points for a control survey for various route location projects.
3. Plan, develop, design, and lay out a photogrammetric survey.
4. Design, compute, and lay out a simple highway curve alignment.
5. Design, compute, and lay out a complex highway curve alignment.
6. Design, compute, and lay out various transportation projects using proper staking applications.
7. Design, compute, and lay out vertical highway alignments.
8. Compute and lay out slope staking locations for a transportation project.
9. Navigate to points using GPS equipment.
10. Perform a control survey using GPS equipment and software.
11. Three exams and one final exam.
12. Reading in assigned text, 20-30 pages per week.

## 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.

Homework problems, Field work, Lab reports

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  
30 - 40%

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

Multiple choice, Matching items, Completion,  
COMPUTATIONAL

Exams  
25 - 35%

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

Class Participation

Other Category  
0 - 10%

**Representative Textbooks and Materials:**

Construction Surveying and Layout, 3rd edition. Crawford, Wesley. Creative Construction, 2003.