

CATALOG INFORMATION

Dept and Nbr: CEST 53 Title: RT SURVEY & DESIGN
Full Title: Route Surveying & 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: CET 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:
CEST 50B (formerly CET 50B) and CEST 51 (formerly CET 51) or their equivalents with grades of "C" or better.

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Route surveying methods & design. Geometric design & construction staking of transportation routes. Use & care of electronic surveying equipment, computers, data collectors. Introduction to photogrammetry & global positioning systems. (Grade Only)
Prerequisites/Corequisites: CEST 50B (formerly CET 50B) and CEST 51 (formerly CET 51) or their equivalents with grades of "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:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:	Transferable	Effective: Fall 1981	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:

The students will:

1. List in order, the steps in developing a route location and give an illustrative example of each step.
2. Define and give an illustrative example for the use of horizontal and vertical control surveys.
3. Reduce field notes for horizontal and vertical control surveys and adjust each using the appropriate methods.
4. Calculate the position of control points using the state plane coordinate system, including sea level reductions.
5. Determine the necessary data to stake-out route curves, including simple, compound, reverse and vertical curves.
6. Determine the necessary data to establish the location for a superelevated horizontal curve.
7. Calculate the volume of earth by average end and contour methods.
8. Construct a mass diagram using data determine from cross-section survey.
9. Operate electronic surveying instruments, data collectors, and integrate with PC's.

Topics and Scope:

1. Route location process.
2. Types and methods of route surveys.
3. Control surveys and the application in route location.
4. Geometric design of routes and layout techniques.
5. Special alignment problems.
6. Earth work computations and the mass diagram.

7. Construction layout techniques.
8. Slope staking.
9. Use of electronic surveying instruments.

Assignment:

1. Reductions and adjustments of horizontal and vertical control surveys.
2. State plane coordinate systems and reductions.
3. Horizontal geometric design process and location.
4. Vertical geometric design process and location.
5. Earth work calculations by average end.
6. Earth work calculations by contours.
7. Constructing mass diagrams.
8. Contract administration and change orders.
9. Use of electronic surveying instruments in design and location surveys.
10. Construction staking problems and techniques.

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, 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
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:

ROUTE SURVEYING AND DESIGN, 5th ed. by Meyer-Gibson; Harper and Row, 1980.