

COURSE CODE: CE-212
COURSE NAME: ENGINEERING SURVEYING
CREDIT HOURS: Theory = 02
 Practical = 01
 Total = 03
CONTACT HOURS: Theory = 32
 Practical = 48
 Total = 80
PREREQUISITE: Nil

MODE OF TEACHING: Lectures and Practical Field Work
 Instruction: Two hours of lecture per week
 67%
 Practical/Laboratory Demonstration: Three hours of Lab work per week
 33%

COURSE DESCRIPTION:

This course is designed to give the basic survey and levelling knowledge to prospective civil engineers. This knowledge is of fundamental importance for planning, design and construction work of Civil Engineering Projects. It is also required for interpreting topographic maps for setting out works exercising dimensional control, monitoring levelling profiles and quality of finished output. In this course most of the field data is acquired manually using conventional methods.

COURSE OBJECTIVES:

To learn the basic principles and techniques of surveying and carryout limited survey tasks by using conventional survey instruments.

RELEVANT PROGRAM LEARNING OUTCOMES (PLOs):

The course is designed so that students will achieve the PLOs:

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|---|---------------------------------|-------------------------------------|----|--|-------------------------------------|
| 1 | Engineering Knowledge | <input checked="" type="checkbox"/> | 7 | Ethics | <input type="checkbox"/> |
| 2 | Problem Analysis | <input type="checkbox"/> | 8 | Individual and Collaborative Team Work | <input checked="" type="checkbox"/> |
| 3 | Design/Development of Solutions | <input type="checkbox"/> | | | |
| 4 | Investigation | <input type="checkbox"/> | 9 | Communication: | <input type="checkbox"/> |
| 5 | Tool Usage | <input type="checkbox"/> | 10 | Project Management and Finance | <input type="checkbox"/> |
| 6 | The Engineer and the World | <input type="checkbox"/> | 11 | Lifelong Learning | <input type="checkbox"/> |

COURSE LEARNING OUTCOMES:

1. Upon successful completion of the course, the students will be able to:

S.No	CLO	Domain	Taxonomy Level	PLO
1	Explain basic survey concepts for application to civil engineering.	Cognitive	2	1
2	Demonstrate efficiency in handling of basic survey equipment.	Psychomotor	4	1
3	Commit to individual or group survey tasks as a leader or member expressing team spirit and	Affective	3	8

	inspiring conduct.			
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PRACTICAL APPLICATIONS:

A site engineer is required to implement a plan on ground based on the maps and charts made by the design office. For setting out these works on the ground correctly and efficiently, he/she must have a sound knowledge of survey and leveling. Studying this subject will give him/her an understanding of map versus ground correlation which is essential for implementation of design office plans on ground.

As a design engineer he must interpret site maps intelligently not only for the most suitable orientation of the project but also for planning and designing the external services like access roads, water supply, sewerage, electricity and gas etc.

TOPICS COVERED WITH THEIR CONTRIBUTION TO PLOs:

Theory:

<u>Week</u>	<u>Topic Covered</u>	<u>Reading Assignment/ Home Work</u>		<u>CLO No</u>	<u>Assessment Methodology</u>	
1 - 2	Introduction to land survey, definition of basic surveying terms branches and their application, Instruments used	Ref 1 (Vol 1), Chap 1		1	Assignments, Quizzes, MSE, CEP, OEL & ESE	
3 - 4	Traversing, Computations and Plotting. Establishment of control points by Total station Traverse, Computations and Plotting.	Ref 1 (Vol 1), Chap 5	Assignment 1 Quiz 1	1		
5	How to make a scale line	Ref 1 (Vol 1), Chap 1	Assignment 2 Quiz 2	1		
6	Plane Table Survey, Maps and Plans, plotting, contour maps	Ref 1 (Vol 1), Chap 6		1		
7-8	Triangulation. Classification of triangulation systems	Ref 1 (Vol 2), Chap 8	Assignment 3 Quiz 3	1		
9	Mid Semester Exam					
10-11	Levelling. Methods and types of levels, precise leveling	Ref 1 (Vol 1), Chap 8		1		
12	Contouring. Methods and application of contouring	Ref 1 (Vol 1), Chap 8	Assignment 4 Quiz 4	1		
13-15	Road Alignment. Profiles, cross-sections, computation of area and volumes by various methods including graphical analysis and use of software	Ref 1 (Vol 2), Chap 5		1		
16	Introduction to baseline and application of corrections	Ref 1 (Vol 1)	Assignment 5 Quiz 5	1		
17-18	End Semester Exam					

Practical

S No.	Practical	Assessment Methodology	Learning Domain/ Taxonomy Level
1	Introduction to basic survey instruments and their use	Lab Manual, Lab Quiz, Lab Rubrics	P4, A3
2	Measurement of distances with linear measurements, chain surveying and plotting		P4, A3
3	Measurement of angles and distances with a total station		P4, A3
4	Performing the following operations with a Total Station. a. R.D.M(Remote Distance Measurement) b. R.E.M (Remote Elevation Measurement) c. Find the position of unknown point with reference to existing known control points. d. Area perimeters (for finding the Area and perimeter of plan and irregular surfaces). e. Stake out (for layout of buildings and other infrastructure like roads etc.).		P4, A3
5	Establishment of survey control points by Total station Traverse.		P4, A3
6	Developing a Topographic Map by Plane Table Survey. Plane Table Surveying radiation and intersection methods. Two Point Problem, Three Point Problem		P4, A3
7	Differential and Profile Levelling.		P4, A3
8	Contouring. Levels and plotting of contours		P4, A3
9	Road Alignment. Cross-sectioning and plotting		P4, A3
10	Triangulation		P4, A3

TEXT AND MATERIAL

Textbook (s)

1. Survey & Levelling by T.P.Kanetkar and S.V.Kulkarni (Vol -I&Vol -II)
2. Surveying Principles and Application by Barry Kavanagh

References Material

1. Survey for Engineers by John Uren & Bill Price

ASSESSMENT SYSTEM

Assessment System for Theory

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

Assessment System for Lab

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assessment/ Viva	20%