Title of Course:	**:**	**Surveying (Th + Pr) (2 + 2)**
Course Code	**:**	CET104
Semester	**:**	2nd
Technology	**:**	Civil Engineering Technology
Effective	**:**	24 – Batch
Pre-requisite	**:**	Nil
Co-requisite	**:**	Nil

Assessment	**:**	**Theory**		**Practical**	
	:	Quizzes/Test (s): 05 Marks Assignments/Projects/Presentations: 05 Marks Mid Semester Exam: 15 Marks Final Semester Exam: 25 Marks		Lab Rubrics: 30 % Open Ended Lab/Mini Project: 20 % Final Exam; Objective Test*: 30 % Final Exam; Conduct of Practical/Viva Voce*: 20 % *Appearance in Final Exams is mandatory	
Credit Hours/week	**:**	**Th**	2	**Pr**	2
Minimum Contact Hours	**:**	**Th**	32	**Pr**	96
Marks	**:**	**Th**	50	**Pr**	100

After Completing the Course, each student will be able to:

Sr. No.	Theory/ Practical	CLO	Taxonomy Level	PLO
1	Theory	Explain different survey techniques for measurements for horizontal and vertical plane.	C-2	1
2	Theory	Solve problems using surveying techniques.	C-3	2
3	Practical	Operate various surveying equipment for measurements with required accuracy	P3	5
4	Practical	Participate willingly in group activities during the field work of survey experiments.	A2	9

Relevant Program Learning Outcomes (PLOs):

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

1	Engineering Knowledge	□	7	Environment and Sustainability:	
2	Problem Analysis:	□	8	Ethics:	
3	Design/Development of Solutions:		9	Individual and Team Work:	□
4	Investigation:		10	Communication:	
5	Modern Tool Usage:	□	11	Project Management:	

6	The Engineering Society:		12	Lifelong Learning:	

OBJECTIVES:

- To understand different survey techniques for measurements for horizontal and vertical plane.
- To solve problems using surveying techniques.

COURSE OUTLINE:

Introduction

Introduction to Surveying and types, Classification of surveys, Surveying Techniques, Measurements, and their Units.

Computation of Areas and Volume

Computation of areas by using mid-ordinate rule, average ordinate rule, trapezoidal and Simpson rule, Computation of areas by co-ordinates.

Theodolite Traversing

Adjustment of transit theodolite, traversing with theodolite, Traverse computations, Closing error and its adjustment, Computation of Omitted measurements.

Tachometric Surveying

System of tachometry, Principles and field procedures of tachometry, Use of tachometry for traversing.

Levelling

Introduction to Levelling, Benchmark and reference points, Line of collimation and line of sight, Back sight and foresight readings, Reduced levels and height of instrument.

Levelling Procedures: Setting up the instrument, Taking readings on staff (staff readings), Booking field notes, Calculating reduced levels.

Types of Levelling: Differential levelling (using a level instrument), Trigonometric levelling (using angles and distances), Profile levelling (for road or railway alignment),

Errors and Corrections: Sources of errors in levelling, Error detection and elimination, Applying corrections (e.g., curvature and refraction corrections).

Contours and Contour Maps: Understanding contour lines, Drawing contour maps from levelling data, Interpreting contour maps for terrain features.

Applications: Construction site levelling, Topographic mapping, Floodplain analysis, Land development.

Highway Curves

Introduction to curves, Types of curves, Simple circular curves, Compound curves, reverse curves, transition curves, vertical curves, Computation and setting out of curves by different methods.

Hydrographic Surveying

Hydrographic Surveying and its applications, Sounding and instruments used in soundings, Shore line survey and location of soundings.

PRACTICAL WORK TO BE CARRIED OUT:

1. To range out a survey line using ranging rods (Direct & Indirect ranging)
2. To measure the horizontal distance between two terminal stations by different methods. (Pacing, Measuring Tape and Chain).
3. To determine the horizontal distance between the two terminal stations on a sloping ground by (i). Stepping Method. (ii). Using Abney Level
4. To set out baseline and perpendicular line/offsets in the field using optical square and 3- 4-5 method.
5. Layout of rooms of a house by offset method using Pythagoras Theorem.
6. To measure the magnetic bearing of a lines with the help of Prismatic Compass.
7. Introduction to Auto level and its temporary adjustment and determine staff reading on natural ground by using Auto Level.

8. To draw profile (L-section) and cross-sectional levelling of an existing road by obtaining data using Auto level. (In two Sessions)
9. Introduction to Digital Theodolite, its temporary adjustment and determine horizontal angle, vertical angle and bearing.

10.To determine latitude and departure of lines and calculate the area of closed traversed by coordinates method.To determine the Horizontal distances and Vertical distances by Tachometric Surveying.

11.To determine the independent coordinates of an existing building by Theodolite Traversing and plot it coordinates by using Excel / AutoCAD Software.

12.To measure the Heights of buildings and determine R.L at top of elevated object by Trigonometric Levelling.

13.Introduction and handling of a Total Station

14.To determine Coordinates of different point in the filed using Total Station.

15.Open ended Lab.

RECOMMENDED BOOKS:

1. Surveying Vol: (I + II), B.C Purnima, Latest Edition
2. Surveying & Leveling by N.N Basak, Latest Edition
3. Advance Civil Engineering Surveying by Muhammad Asif Shaikh, Latest Edition
4. Surveying & Leveling CT-114 by Ali Aftab, Latest Edition
5. Plane Surveying, Dr A M Chandra, Latest Edition

Approval:	Industrial Advisory Board	Res No. 9.4	Dated: 09/05/2024
	Board of Studies	Res.No.2.3	Dated: 29/05/2024
	Board of Faculty	Res.No.3.1	Dated: 19/08/2024
	Academic Council	Res.No.108.3(ii)	Dated:31/10/2024

Title of Course:	**:**	**Concrete Technology (Th + Pr) (2 + 2)**			
Course Code	**:**	CET103			
Semester	**:**	2nd			
Technology	**:**	Civil Engineering Technology			
Effective	**:**	24 – Batch			
Pre-requisite	**:**	Nil			
Co-requisite	**:**	Nil			
Assessment	**:**	**Theory**		**Practical**	
	:	Quizzes/Test (s): 05 Marks Assignments/Projects/Presentations: 05 Marks Mid Semester Exam: 15 Marks Final Semester Exam: 25 Marks		Lab Rubrics: 30 % Open Ended Lab/Mini Project: 20 % Final Exam; Objective Test*: 30 % Final Exam; Conduct of Practical/Viva Voce*: 20 % *Appearance in Final Exams is mandatory	
Credit Hours/week	**:**	**Th**	2	**Pr**	2
Minimum Contact Hours	**:**	**Th**	32	**Pr**	96
Marks	**:**	**Th**	50	**Pr**	100

After Completing the Course, each student will be able to:

Sr. No.	Theory/ Practical	CLO	Taxonomy Level	PLO
1	Theory	**DISCUSS** various properties of concrete and its constituent materials.	C2	1
2	Theory	**DEMONSTRATE** the basics of concrete mix design considering various parameters using standard guidelines.	C3	3
3	Practical	**PERFORM** laboratory tests on fresh concrete and its constituent materials.	P3	4
4	Practical	**CONTRIBUTE** in lab work with professionalism by understanding the significance of accurate testing, documentation, and adherence to standards in concrete experiments.	A2	8

Relevant Program Learning Outcomes (PLOs):

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

1	Engineering Knowledge	□	7	Environment and Sustainability:	
2	Problem Analysis:		8	Ethics:	□
3	Design/Development of Solutions:	□	9	Individual and Team Work:	
4	Investigation:	□	10	Communication:	
5	Modern Tool Usage:		11	Project Management:	

6	The Engineering Society:		12	Lifelong Learning:	

OBJECTIVES:

To understand various properties of concrete and its constituent materials.

To be able to design concrete mixes considering various parameters using standard guidelines.

COURSE OUTLINE:

- Cement, physical and chemical properties of cement, Type of cements and their use.
- Aggregate, types of aggregate, various properties of aggregates.
- Admixtures, various types of admixtures and their use in concrete.
- Water, quality of water for the use in concrete.
- Procedure for design of concrete mixes, DOE method, ACI method
- Production of concrete, batching, mixing, transportation, placing, compaction and curing of concrete.
- Properties of concrete in fresh state.
- Properties of concrete in hardened state
- Non-destructive testing of concrete samples

PRACTICAL WORK TO BE CARRIED OUT:

1. To determine the soundness of a given sample of cement by Le-Chatelier's Apparatus.
2. To determine the initial and final setting time of a given sample of cement.
3. To determine the zoning of a given sample of fine aggregate.
4. To determine the maximum size of a given sample of coarse aggregate.
5. To determine the specific gravity of a given sample of fine and coarse aggregate.
6. To determine the unit weight of a given sample of fine and coarse aggregate.
7. To determine the water absorption of a given sample of fine and coarse aggregate.
8. To determine the quantity of silt and clay in a given sample of fine aggregate.
9. To prepare the concrete mix and determine the workability of fresh concrete by:
   (a) slump test method
   (b) compaction factor test method and
   (c) V-Bee Consistometer test method
10. To determine the unit weight of hardened concrete.
11. To determine the water absorption of hardened concrete.
12. To cast cubes and cylinders and determine the compressive strength of concrete cubes and cylinders.
13. To determine the splitting tensile strength of concrete cylinders.
14. To determine the compressive strength of concrete sample by schmidt Hammer.
15. To take out the concrete core by core cutting machine and determine its compressive strength.
16. Open ended lab.

RECOMMENDED BOOKS:

1. Properties of Concrete by A. M. Neville; Wiley John & Sons. (Latest Edition).
2. Concrete Technology - Theory and Practice - M. S. Shetty.
3. Concrete Design by Zahid Ahmad Siddiqi, Help Civil Engineering Publishers, Lahore, 2009.

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