

**DEPARTMENT OF CIVIL ENGINEERING**  
**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
Course Title	SURVEYING		
Course Code	CEPC13	No. of Credits	3
Course Code of Pre-requisite subject(s)	-		
Session	July. 2022	Section (if, applicable)	A & B
Name of Faculty	Dr. Nisha Radhakrishnan	Department	Civil Engineering
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Name of Course Coordinator(s) (if, applicable)	NIL		
E-mail	NIL	Telephone No.	NIL
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		

**Syllabus (approved in BoS)**

Introduction and Principles of surveying – Classification – Brief introduction to chain surveying – Compass surveying – Bearing of survey lines – systems and conversions – Local attraction – Latitude and departure – Traverse adjustment of closing errors

Plane Table surveying – instruments and accessories – methods of plane tabling - Levelling – Levelling instruments – Temporary and permanent adjustments – Booking – Reduction to levels – Correction for Curvature and refraction

Theodolite surveying – Vernier theodolite – Temporary and permanent adjustments – Measurement of horizontal and vertical angles –Tacheometric surveying – Stadia system – Fixed and Movable hair methods –Subtense bar – Tangential method

Geodetic surveying - Triangulation – different networks – orders and accuracies – intervisibility and height of stations – Trigonometrical levelling – Observations for heights and distances – Geodetic observations

Application of surveying - Curve setting – Types – Introduction to Advanced Surveying equipments - EDM – Total station - Remote Sensing – GPS - GIS

**References:**

1. Duggal, S.K. Surveying Vol. I and II, Tata McGraw Hill, 2004.
2. Punmia, B.C. Surveying Vol.I and II, Standard Publishers, 1994.
3. Arora, K. R. Surveying Vol. I and II, Standard Book House, 1996.
3. Arora, K. R. Surveying Vol. I and II, Standard Book House, 1996.
4. Satheesh Gopi. Advanced Surveying, Pearson Education, 2007.

5. Satheesh Gopi. The Global Positioning System and Surveying using GPS, Tata McGraw, 2005.

### COURSE OBJECTIVES

- To understand the importance of surveying in the field of civil engineering
- To get introduced to different plane and geodetic surveying applications such as chain, compass, plane table, leveling, triangulation, trigonometric leveling etc
- To understand the significance of each method in civil engineering and master the skill to carry out the proper surveying method in the field.
- To design numerical solutions for carrying out surveying in civil engineering field.
- To get introduced to modern advanced surveying techniques involved such as Remote sensing, Total station, GPS etc.

### COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Knowledge of the importance of preliminary surveying such as chain surveying, compass surveying and error adjustment in the field of civil engineering applications such as structural, high way engineering, geotechnical engineering	1 2 4 9 10 11 12
2. Ability to plan a survey, taking accurate measurements, field booking, plotting and adjustment of traverse can be understood through leveling, plane table surveying etc	1 2 4 9 10 11 12
3. Understanding of fundamental function, use of Theodolite and tacheometry in practical applications such as road alignment, height of building, control point setting etc, with respect to utility and precision through the use of Theodolite, tacheometry	1 2 4 9 10 11 12
4. Ability to understand the concepts of geodetic surveying in plan a large scale survey	1 2 4 9 10 11 12
5. Ability to use the principles of curve, building setting and understand the importance of advances surveying measurement techniques in civil engineering applications.	1 2 4 5 9 10 11 12

### COURSE PLAN – PART II

#### COURSE OVERVIEW

To give an overall overview of different Surveying Techniques and its applications through theoretical, practical sessions and tutorials.

#### COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	Week 1	<ul style="list-style-type: none"> <li>• Introduction and Principles of surveying</li> <li>• Classification</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> </ul>
2.	Week 2	<ul style="list-style-type: none"> <li>• Brief introduction to chain surveying</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> </ul>
3.	Week 3	<ul style="list-style-type: none"> <li>• Compass surveying – Bearing of survey lines – systems and conversions</li> <li>• Local attraction – Method I</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/Problems</li> </ul>
4.	Week 4	<ul style="list-style-type: none"> <li>• Local attraction – Method II</li> <li>• Tutorial 1</li> <li>• Latitude and departure – Traverse adjustment of</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/Problems</li> <li>• Open Book problems</li> </ul>

		closing errors	
5.	Week 5	<ul style="list-style-type: none"> <li>• Tutorial 2</li> <li>• Plane Table/ Levelling – Lab Session</li> <li>• Plane Table surveying – instruments and accessories</li> </ul>	<ul style="list-style-type: none"> <li>• Open Book problems</li> <li>• Survey Lab Demo</li> <li>• Chalk and Board</li> </ul>
6.	Week 6	<ul style="list-style-type: none"> <li>• Methods of plane tabling</li> <li>• Levelling – Levelling instruments – Temporary and permanent adjustments</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> <li>•</li> </ul>
7.	Week 8	<ul style="list-style-type: none"> <li>• Levelling Booking - Reduction to levels Method I</li> <li>• Levelling Booking - Reduction to levels Method II</li> <li>• Tutorial 3</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/Problems</li> <li>• Open Book Problems</li> </ul>
8.	Week 9	<ul style="list-style-type: none"> <li>• Correction for Curvature and refraction</li> <li>• Theodolite Surveying, Temporary and permanent adjustment – Lab Session</li> <li>• Measurement of horizontal and vertical angles</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> <li>• Survey Lab Demo</li> <li>• Chalk and Board</li> </ul>
9.	Week 10	<ul style="list-style-type: none"> <li>• Measurement of horizontal and vertical angles</li> <li>• Tacheometric surveying, systems</li> <li>• Stadia system –Fixed methods</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> <li>• Chalk and Board</li> <li>• Chalk and Board/Problems</li> </ul>
10.	Week 11	<ul style="list-style-type: none"> <li>• Stadia system – Fixed methods</li> <li>• Movable hair methods, Subtense Bar</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/Problems</li> <li>• Chalk and Board/Problems</li> </ul>
11.	Week 12	<ul style="list-style-type: none"> <li>• Tangential method</li> <li>• Tutorial 4</li> <li>• Geodetic surveying - Triangulation – different networks – orders and accuracies</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/ Problems</li> <li>• Open Book Problems</li> <li>• Chalk and Board</li> </ul>
12.	Week 13	<ul style="list-style-type: none"> <li>• Intervisibility and height of stations</li> <li>• Trigonometrical levelling – Observations for heights and distances Methods 1 &amp; 2</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board</li> <li>• Chalk and Board/Problems</li> </ul>
13.	Week 14	<ul style="list-style-type: none"> <li>• Observations for heights and distances Methods 3 &amp; 4</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board/Problems</li> </ul>

		<ul style="list-style-type: none"> <li>• Tutorial 5</li> <li>• Geodetic observations</li> </ul>	<ul style="list-style-type: none"> <li>• Open Book Problems</li> <li>• Chalk and Board</li> </ul>
14.	Week 16	<ul style="list-style-type: none"> <li>• Curve setting – Types</li> <li>• Introduction to Advanced Surveying equipments</li> <li>• Lab Session</li> <li>• EDM – Total station</li> </ul>	<ul style="list-style-type: none"> <li>• Chalk and Board,</li> <li>• Survey Lab Demo</li> <li>• PPT</li> </ul>
15.	Week 17	<ul style="list-style-type: none"> <li>• Remote Sensing</li> <li>• GPS</li> </ul>	<ul style="list-style-type: none"> <li>• PPT</li> </ul>

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Mid Semester Exam	Week 13	1.5 hours	25
2	Mid Sem Quiz	Week 13		5
3	Tutorials (1 to 4)	To be taken during the regular Classes		20
CPA	Compensation Assessment*	Week 17	1.5 hour	25
4	End Sem Quiz	Week 18-19		10
5	Final Assessment *	Week 18-19	3 hours	40

**COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)**

It is proposed to take feedback from the students, at the end of the semester to evaluate the execution of the course.

**COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)**

**MODE OF CORRESPONDENCE (email/ phone etc):**

- Mode of Correspondence would be through phone/Email only to the Class Representatives and Vice Versa.

**COMPENSATION ASSESSMENT POLICY**

- Retest would only be given to those students who have missed Mid Semester Exam on genuine grounds.

**ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)**

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

**GRADING**

- Grading will be as per institute norms
- Passing minimum shall be maximum of 35% or class average/2

**ADDITIONAL INFORMATION**

- The Course Coordinator is available for consultation during office hours.
- Queries, if any, can also be emailed to the Course Coordinator directly at [nisha@nitt.edu](mailto:nisha@nitt.edu).

**FOR APPROVAL**

Course Faculty Nisha CC-Chairperson Dr. Sumitha V HOD AC