



Lok Jagruti Kendra University
University with a Difference

Diploma in Architectural Assistantship



Course Code:025080303
Surveying and Levelling

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|--------------------------------|-------------------------|--|-----|-----|--------------------|-----------|
| Programme / Branch Name | | Diploma in Architectural Assistantship | | | | |
| Course Name | Surveying and Levelling | | | | Course Code | 025080303 |
| Course Type | HSSC | BSC | ESC | PCC | OEC | PEC |

Legends: HSSC: Humanities and Social Sciences Courses
 ESC: Engineering Science Courses
 OEC: Open Elective Courses

BSC: Basic Science Courses
 PCC: Program Core Courses
 PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

| Teaching Hours / Week / Credits | | | | Evaluation Scheme | | | |
|---------------------------------|---|---|--------------|-------------------|----------|----------|-------|
| L | T | P | Total Credit | CCE | SEE (Th) | SEE (Pr) | TOTAL |
| 2 | 0 | 2 | 3 | 50 | 50 | 50 | 150 |

Legends:

L: Lectures T: Tutorial P: Practical
 CCE: Continuous & Comprehensive Evaluation
 SEE (Th): Semester End Evaluation (Theory)
 SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ Basic mathematics

3. Rationale

Students need to have information of the field and its topography to prepare maps or drawings; for any civil or architectural work. This course will help the students to get familiar with the various surveying instruments and will help to improve the understanding of the topography of building sites. This course will provide an opportunity to develop skills in surveying at the primary level.

4. Objectives

- ✓ Carry out a field survey and prepare required drawings and maps.
- ✓ Interpret the drawings, contour maps, etc.



5. Contents

| Unit No. | Unit Name | Topics | Learning Outcomes | % Weightage | Hours |
|----------|--|--|--|-------------|-------|
| 1. | Fundamental Definition and Concepts | 1.1. Surveying: Object 1.2. Primary Division of Surveying 1.3. Classification 1.4. Principles of Surveying 1.5. Plans and Maps 1.6. Scales 1.7. Diagonal Scale | <ul style="list-style-type: none"> • Explain the Basics of Surveying. • Use Scales as Per Requirements. | 5 | 2 |
| 2. | Linear Measurements | 2.1. Different Methods 2.2. Direct Measurements 2.3. Instruments for Chaining 2.4. Ranging Out Survey Lines 2.5. Chaining 2.6. Errors Due to Incorrect Chain 2.7. Chaining on Sloping Ground 2.8. Errors in Chaining | <ul style="list-style-type: none"> • Perform Linear Measurements Using Simple Tools and Equipment. | 15 | 4 |
| 3. | Chain Survey | 3.1. Chain Triangulation 3.2. Survey Station 3.3. Survey Lines 3.4. Locating Ground Features: Offsets 3.5. Field Book 3.6. Instruments for Setting Out Right Angles 3.7. Obstacles in Chaining 3.8. Plotting A Chain Survey | <ul style="list-style-type: none"> • Perform Chain and Tape Survey. • Prepare Drawing As Per Recorded Measurements. | 10 | 3 |
| 4. | Compass Survey | 4.1. Introduction 4.2. Bearings and Angels 4.3. The Prismatic Compass 4.4. The Surveyor's Compass 4.5. Magnetic Declination 4.6. Local Attraction 4.7. Errors in Compass Survey | <ul style="list-style-type: none"> • Perform Angular Measurements Using the Appropriate Compass. • Prepare Drawing as Per Recorded Measurements. | 30 | 7 |
| 5. | Levelling | 5.1. Definitions 5.2. Methods of Levelling 5.3. Levelling Staff 5.4. Temporary Adjustment of a Level | <ul style="list-style-type: none"> • Use Levels for Surveying Application. • Prepare Contour Maps by Calculating Reduce Level. | 40 | 12 |



| | | | | |
|--|---|--|--------------------|-----------|
| | 5.5. Theory of Direct Levelling 5.6. Differential Levelling 5.7. Booking and Reducing Levels 5.8. Errors in Levelling 5.9. Contouring 5.10. Contour Interval 5.11. Characteristics of Contour 5.12. Interpolation of contour | | | |
| | | | Total Hours | 28 |

6. List of Practicals / Exercises

The practicals/exercises have been properly designed and implemented in an attempt to develop different types of skills, so that students can acquire the competencies/programme outcomes. Following is the list of practicals/exercises.

| Sr. No | Practical / Exercises | Key Competency | Hours |
|--------------------|---|---|-----------|
| 1 | Demonstrate the uses of survey tools and equipment | To help the students to get familiar with the various surveying instruments | 06 |
| 2 | Carry out the surveying project on a given site to locate surrounding features using chain and compass | Carry out a field survey and prepare required drawings and maps. | 08 |
| 3 | Carry out levelling project on undulating ground and prepare the drawing sheet showing the ground profile and contours of the site. | Carry out field survey by level and to Interpret the drawings, contour maps | 14 |
| Total Hours | | | 28 |

7. Suggested Specification Table for Evaluation Scheme

| Unit No. | Unit Name | Distribution of Topics According to Bloom's Taxonomy | | | | | |
|----------|-------------------------------------|--|-----|-------|-----|-----|------|
| | | R % | U % | App % | C % | E % | An % |
| 1 | Fundamental Definition and Concepts | 30 | 40 | 30 | - | - | - |
| 2 | Linear Measurements | 30 | 40 | 30 | - | - | - |
| 3 | Chain Survey | 10 | 30 | 30 | 10 | 5 | 5 |
| 4 | Compass Survey | 10 | 30 | 30 | 15 | 10 | 5 |
| 5 | Levelling | 10 | 30 | 40 | 10 | 5 | 5 |

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing



8. Textbooks

- 1) Surveying and Levelling Vol-I, Dr. B. C. Punmia, Laxmi Publications Pvt. Ltd.

9. Reference Books

- 1) Surveying and Levelling Vol-I, T. P. Kanetkar & S. V. Kulkarni, Puna Vidyarthi Griha Prakashan.

10. Open Sources (Website, Video, Movie)

- 1) <https://nptel.ac.in/courses/105/107/105107122/>
- 2) <https://civiltoday.com/surveying/87-surveying>
- 3) <https://landsurveyorsunited.com/>
- 4) https://www.youtube.com/playlist?list=PLcWeCCSvXbNkDkTIf9iagW9VQFFa_hpev

