

Survey Engineering (Instructor)

1. Introduction:

- 1.1 History and definition of surveying
- 1.2 Primary division of survey
- 1.3 Various ways of Classifications of survey
- 1.4 Principles of surveying
- 1.5 Units of measurements
- 1.6 Scales and their types
- 1.7 Significance of surveying in Agricultural Engineering

2. Linear Distance Measurement

- 2.1 Horizontal distance
- 2.2 Different methods of distance measurement i.e. direct, indirect and GPS technology
- 2.3 Equipments for direct chaining
- 2.4 Ranging and its methods
- 2.5 Chaining on horizontal and sloping ground by direct and indirect methods
- 2.6 Errors in chaining
- 2.7 Tape correction for various parameters

3. Chain Surveying:

- 3.1 Principles of chain surveying
- 3.2 Survey stations and Survey lines
- 3.3 Procedures of chain surveying
- 3.4 Obstacles in chaining
- 3.5 Plotting and field problems

4. Compass Traversing:

- 4.1 Introduction
- 4.2 Terminologies used in compass survey
- 4.3 System of bearings, fore and back bearing
- 4.4 Prismatic and Surveyor's compass
- 4.5 Calculation of angles from bearing and bearing from angles
- 4.6 Magnetic declination, local attraction, detection and correction of local attraction

5. Leveling:

- 5.1 Definition and objectives
- 5.2 Classification of leveling according to principles
- 5.3 Terminologies used in leveling
- 5.4 Instruments used in leveling
- 5.5 Temporary adjustment of level
- 5.6 Two peg test
- 5.7 Methods for booking and reducing of level
- 5.8 Classification of direct leveling
 - 5.8.1 Simple leveling
 - 5.8.2 Continuous or differential leveling
 - 5.8.3 Fly leveling
 - 5.8.4 Check leveling
 - 5.8.5 Reciprocal leveling
 - 5.8.6 Profile leveling and cross sectioning
 - 5.8.7 precise leveling
- 5.9 Errors in leveling
- 5.10 Error adjustment in closed circuit

6. Contouring:

- 6.1 Definition - Contour interval, Horizontal equivalent, general contours, Index contour
- 6.2 Criteria for selection of contour interval 1.3 Characteristics of contours
- 6.3 Methods of control for contour survey, Direct method , Indirect method
- 6.4 Methods of interpolation of contours
- 6.5 Uses of contour maps

7: Plane Tabling:

- 7.1 Definition and principles
- 7.2 Accessories used in plane tabling
- 7.3 Working operations - temporary adjustment and orientation
- 7.4 Methods of plane tabling -Radiation, Intersection, Traversing and Resection (Introduction only for resection)
- 7.5 Errors in plane table surveying
- 7.6 Advantages and disadvantages of plane table surveying

8: Theodolite:

- 8.1 Introduction and uses of Theodolite
- 8.2 Geometry of Theodolite
- 8.3 Classification of Theodolite
- 8.4 Technical terms, fundamental lines and planes of Theodolite
- 8.5 Working principle of Theodolite
- 8.6 Temporary adjustment of Theodolite

- 8.7 Measurement of angles
- 8.8 Horizontal angles
- 8.9 Vertical and zenithal angles
- 8.10 Laying out of horizontal angles
- 8.11 Errors in Theodolite survey

9: Theodolite Traversing:

- 9.1 Traverse definition, purpose, types and equipment's
- 9.2 Traverse field works
- 9.3 Traverse adjustment and computation of total coordinates
- 9.4 Traverse plotting
- 9.5 Omitted measurements in traverse

10: Area and Volume Measurements:

- 10.1 Basic definition
- 10.2 Area by division into simple figures
- 10.3 Area by different methods - Area by coordinates, Area by trapezoidal rule,
Area by Simpson's 1/3 rule
- 10.4 Volume by cross section
- 10.5 Volume by Trapezoidal formula
- 10.6 Volume by Prismoidal formula