

SURVEYING - I

Course Code: 13CE1101

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Course Outcomes:

At the end of the course the student will able to:

- CO 1** Describe the principles and classification of surveying.
- CO 2** Calculate angular measurement including true and magnetic bearings.
- CO 3** Associate with plane table surveying.
- CO 4** Measure levels and draw contours.
- CO 5** Assess areas of irregular boundaries, volumes of borrow pits, embankments and capacity of reservoirs.

UNIT-I

(15 Lectures)

INTRODUCTION:

Definition of Surveying- Primary divisions - Classification and principles of surveying- Difference between plan and map. Sources of errors-Linear and Direct measurements.

CHAIN SURVEYING:

Instrumentation for chaining – Types of Chains – Principles of chain surveying- Well conditioned triangle - Selection of Survey Stations - Check lines, Tie lines, Offsets. Errors due to incorrect chain- Chaining on un-even and sloping ground- Errors in chaining - Obstacles in chaining -Conventional signs.

UNIT-II

(10 Lectures)

COMPASS SURVEYING :

Types of compass – Temporary adjustments – Types of Meridians and bearings – W.C.B. and R.B. – Conversion of bearings from one system to the other– Calculation of angles from bearings, Calculation

of bearing from angles - Calculations of included angle from bearings – Dip of a magnetic needle – Magnetic declination – Local attraction and its Corrections – Chain and compass traversing - Checks in closed and open traverse - closed traverse and its adjustment by Bowditch's rule.

UNIT-III

(8 Lectures)

PLANE TABLE SURVEYING:

Introduction - Accessories- Working operations. Methods of plane tabling- Plane table traversing- Three point problem – Two point problem- Errors in plane tabling.

UNIT-IV

(16 Lectures)

LEVELLING AND CONTOURING:

Levelling: Introduction and Terminology, Temporary and permanent adjustments- methods of leveling - Differential leveling, Profile levelling-Cross sections-Reciprocal leveling- Precise levelling . Booking and reduction of levels, H.I. methods - Rise and fall method- Checks, plotting of L.S & C.S.

Contouring: Contours- Uses of contours- Methods of conducting contour surveys and their plotting. Contour gradient-Uses of contour maps.

UNIT-V

(12 Lectures)

AREAS AND VOLUMES:

Area from field notes, Computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes. Determination of the capacity of reservoir. Volume of barrow pits.

TEXT BOOKS:

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Surveying" (Vol – 1), 18th Edition by Laxmi Publications (P) Ltd., New Delhi, 2011.
2. Duggal S K, "Surveying" (Vol – 1), 10th Edition, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.

REFERENCES:

1. Arthur R Benton and Philip J Taety, “*Elements of Plane Surveying*” 8th Edition, McGraw Hill – 2000, 2010.
2. Arora K R “*Surveying*” (Vol 1, 2 & 3) 9th Edition, Standard Book House, Delhi, 2008.
3. Chandra A M, “*Plane Surveying*”, New age International Pvt. Ltd., Publishers, New Delhi, 2009.

