SURVEYING

B.Tech. I Year II Sem

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	TOTAL
23CE204	Engineering Sciences	2	0	0	2	40	60	100
Contact Classes: 32	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes:32		

Course Objectives: The first step in engineering practice is surveying and the soundness of any civil engineering work is dependent on the reliability and accuracy of surveying. Therefore, it is imperative that a student of engineering should have good knowledge of surveying. To impart the knowledge of surveying and latest technologies in surveying it is necessary to introduce this subject in the curriculum.

Course Outcomes: At the end of the course, the student will be able to:

1. Calculate angles, distances and levels
2. Identify data collection methods and prepare field notes
3. Understand the working principles of survey instruments
4. Estimate measurement errors and apply corrections
5. Interpret survey data and compute areas and volumes

UNIT-I

Introduction and Basic Concepts: Introduction, Objectives, classification and principles of surveying, Scales, Shrinkage of Map, Conventional symbols and Code of Signals, Surveying accessories, phases of surveying.

Measurement of Distances and Directions

Linear distances - Approximate methods, Direct Methods- Chains-Tapes, ranging, Tape corrections, indirect methods-optical methods-E.D.M.method.

Prismatic Compass-Bearings, included angles, Local Attraction, Magnetic Declination and dip.

UNIT-II

Levelling and Contouring Leveling-Basics definitions, types of levels and leveling staves, temporary adjustments, methods of levelling, booking and Determination of levels- HI Method-Rise and Fall method, Effect of Curvature of Earth and Refraction.

Contouring- Characteristics and uses of Contours, Direct & Indirect

methods of contour surveying, interpolation and sketching of Contours.

Computation of Areas and Volumes

Areas - Determination of areas consisting of irregular boundary and regular boundary (coordinates, MDM, DMD methods), Planimeter.

Volumes - Computation of areas for level section and two level sections with and without transverse slopes, determination of volume of earth work in cutting and embankments, volume of borrow pits, capacity of reservoirs.

UNIT-III

Theodolite Surveying: Types of Theodolites, Fundamental Lines, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometrical leveling when base is accessible and inaccessible.

Traversing: Methods of traversing, traverse computations and adjustments, Gale's traverse table, Omitted measurements.

UNIT-IV

Tacheometric Surveying: Principles of Tacheometry, stadiaand tangentia l methods of Tacheometry.

Curves: Types of curves and their necessity, elements of simple curve, setting out of simple Curves,

UNIT-V

Modern Surveying Methods: Total Station and Global Positioning System: Basic principles, classifications, applications, comparison with conventional surveying. Electromagnetic wave theory – electromagnetic distance measuring system- principle of working and EDM instruments, Components of GPS – space segment, control segment and user segment, reference systems, satellite orbits, GPS observations. Applications of GPS.

TEXT BOOKS:

1. Surveying and leveling by R.Subramanian, Oxford university press, NewDelhi.
2. ChandraAM, "HigherSurveying", New age International Pvt.Ltd., Publishers, New Delhi, 2002.
3. Hoffman. B,H.Lichtenegga and J.Collins, Global Positioning System-Theory and Practice, Springer -Verlag Publishers,2001.

REFERENCE BOOKS:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, Mc Graw Hill – 2000.
2. Arora K R“SurveyingVol1, 2&3), Standard Book House, Delhi,2004.
3. Surveying (Vol–1, 2&3),by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain- Laxmi Publications(P) ltd., NewDelhi.
4. ChandraAM, “PlaneSurveying”, New Age International Pvt.Ltd., NewDelhi, 2002.
5. Surveying by Bhavikatti; Vikas publishing house ltd.
6. DuggalS K, “Surveying (Vol– 1&2), Tata Mc Graw Hill Publishing Co.Ltd. NewDelhi, 2004.
7. Surveying and leveling by R.Agor Khanna Publishers 2015.