**17CE2203 - SURVEYING – II**

**(Civil Engineering)**

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| **Course Category** | Professional Core | **Credits** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 2-2-0 |
| **Prerequisite** | Surveying-I | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Objectives** | 1. To implement the use of theodolite surveying for measuring various angles. 2. To apply the method of angular surveying (Tacheometric surveying) for computing elevation and distances. 3. To analyze various types of curves and their properties. 4. To understand and implement the remote sensing for aerial surveying. 5. To understand operation and functions of total station. 6. To collect the information from the earth by applying technology of GPS and GIS. | |
| **Course Outcomes** | CO1 | Use a theodolite for measurements in traverse and able to make all computations in traverse. |
| CO2 | Calculate elevation and distances using theodolite. |
| CO3 | Set various types of curves in field. |
| CO4 | Apply the principles of Remote Sensing in surveying. |
| CO5 | Use a total station in surveying. |
| CO6 | Understand the principles and applications of GPS & GIS. |

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| **Course Content** | **UNIT – I**  **THEODOLITE SURVEYING:** Theodolite-Parts-Definitions-Fundamental Axes–Measurement of horizontal angles by repetition and reiteration methods–Measurement of vertical angles, direct angles and deflection angles –Prolonging a straight line – Traverse survey – Checks in traverse – Errors in theodolite traversing – Traverse computations – Coordinate systems – Omitted measurements.  **UNIT – II**  **TACHEOMETRY:** Principle of stadia method – Tacheometric constants and their determination – Determination of distances and elevations of points by stadia and tangential methods – Tacheometric survey – Errors in stadia surveying.  **UNIT – III**  **CURVES:** Principles of simple and compound curves – Curve ranging – Offsets from long chord – Rankine’s method one theodolite method –Two theodolite methods – Reverse curve between parallel straights – Super elevation – Uses and characteristics of transition curve – Length of transition curve – Principles of compound curve – Types and elements of vertical curves.  **UNIT – IV**  **AERIAL SURVEY:** Introduction – Types of photographs – Vertical aerial photographs – Geometry – Scale – Ground coordinates from a vertical photograph – Photomaps and mosaics.  **REMOTE SENSING:** Definition – History – Physics of Remote Sensing – Electromagnetic radiation – Interaction of electromagnetic radiation with atmosphere, earth surface features – Vegetation, soils, water.  **UNIT – V**  **TOTAL STATION INSTRUMENT:** Introduction – Functions – Performed – parts – Handling and setting up a Total Station instrument – Measuring horizontal angles – Deflection angles – Azimuths, vertical or zenith angles – Sights and marks – Adjustments of Total Station instruments and their accessories – Sources of error in Total Station work- Data acquisition process.  **UNIT – VI**  **GLOBAL POSITIONING SYSTEM:** Introduction – Overview of GPS – Reference coordinate systems for GPS – Fundamentals of GPS positioning – differential GPS.  **GEOGRAPHICAL INFORMATION SYSTEM:** Basic principles – Definition – Components – Data Structures – Functioning of GIS - Data Input – Database management systems– Types of maps – Maps & map projections. |
| **Textbooks and Reference Books** | **TEXTBOOKS:**   1. Surveying by Dr.K.R.Arora. 2. Surveying and Levelling Vol. II & III by B.C. Punmia. 3. Surveying and Levelling Parts 1 & 2 by T.P. Kanetkarand S.V.Kulkarni. 4. Surveying & Levelling by R. Subramanyam.   **REFERENCE BOOKS:**   1. Elements of Photogrammetry by P.R.Wolf. 2. Plane Surveying by A.M. Chandra. 3. Elements of Geomatics by P.R.Wolf. |