R. K. Institute of Engineering and Technology

Approved by AICTE, New Delhi and Affiliated to SCTE&VT, Odisha

CIVIL ENGINEERING

SEMESTER : 5th

FROM :01/07/2026 **TO** :05/11/2026

NAME OF THE FACULTY : Er. PRAJNAPARIMITA PAKAL

SUBJECT : SURVEYING

TOTAL CLASS AVAILABLE IN SEMESTER: 45 nos

NO. OF PERIODS : 03/ WEEK

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
1	I	Introduction to Surveying – Purpose, Importance and Applications	Lecture	Understand the role of surveying in civil engineering
2	I	Types of Surveying – Primary, Secondary, Plane, Geodetic, Cadastral, Hydrographic, Photogrammetry & Aerial	Lecture	Classify different types of surveys
3	I	Principles of Surveying	Lecture + Discussion	Explain the fundamental principles of surveying
4	I	Scales – Engineer's Scale, Representative Fraction (RF)	Lecture + Numerical	Use different types of scales
5	I	Diagonal Scale, Revision & Unit Test	Practice/Test	Construct and apply scales
6	II	Chain Surveying – Instruments and Their Uses	Lecture + Demonstration	Identify chain surveying instruments
7	II	Survey Stations, Baseline, Tie Line, Check Line & Offsets	Lecture	Explain chain survey terminology
8	II	Ranging – Direct and Indirect Methods	Demonstration	Perform ranging operations
9	II	Chaining Methods, Obstacles in Chaining	Lecture + Demonstration	Apply chaining techniques
10	II	Errors in Chain Surveying	Lecture	Identify and minimize surveying errors
11	II	Types of Offsets, Conventional Signs & Field Book Recording	Lecture + Practice	Record field observations correctly
12	II	Revision & Unit Test	Practice/Test	Assess Unit-II

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
13	III	Compass Traversing – Open and Closed Traverse	Lecture	Understand compass traversing
14	III	Bearings – WCB, RB, FB & BB, Conversion of Bearings	Lecture + Numerical	Convert and calculate bearings
15	III	Internal & External Angles, Magnetic Declination & Dip	Lecture	Explain magnetic concepts
16	III	Prismatic and Surveyor's Compass – Components & Temporary Adjustments	Demonstration	Operate a compass correctly
17	III	Local Attraction, Corrections, Traverse Plotting & Closing Error	Lecture + Numerical	Correct compass observations
18	III	Revision & Unit Test	Practice/Test	Assess Unit-III
19	IV	Levelling – Basic Terminology	Lecture	Understand levelling concepts
20	IV	Types of Levels & Components of Dumpy Level	Lecture + Demonstration	Identify levelling instruments
21	IV	Temporary Adjustment of Dumpy Level & Levelling Staff	Demonstration	Perform instrument setup
22	IV	Reduction of Levels – Height of Instrument Method	Lecture + Numerical	Compute reduced levels
23	IV	Reduction of Levels – Rise and Fall Method	Numerical Practice	Compare levelling methods
24	IV	Types of Levelling – Simple, Differential, Fly, Profile & Reciprocal	Lecture	Explain levelling applications
25	IV	Contours – Characteristics, Contour Interval & Horizontal Equivalent	Lecture	Interpret contour maps
26	IV	Contouring Methods, Area by Digital Planimeter & Volume from Contours	Lecture + Demonstration	Calculate area and volume
27	IV	Revision & Unit Test	Practice/Test	Assess Unit-IV
28	V	Theodolite – Types, Components & Technical Terms	Lecture	Identify theodolite components
29	V	Fundamental Axes & Temporary Adjustments	Demonstration	Set up a theodolite
30	V	Measurement of Horizontal Angles – Direct & Repetition Methods	Lecture + Practical	Measure horizontal angles
31	V	Vertical Angles, Magnetic Bearing & Line Prolongation	Demonstration	Perform theodolite operations
32	V	Theodolite Traversing – Included & Deflection Angle Methods	Lecture + Numerical	Conduct traverse survey

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33	V	Traverse Computation – Latitude, Departure, Bowditch & Transit Rule	Numerical Practice	Balance traverses
34	V	Revision & Unit Test	Practice/Test	Assess Unit-V
35	VI	Tacheometry – Principles, Anallatic Lens & Formula	Lecture	Explain tacheometric surveying
36	VI	Distance & Elevation by Fixed Hair Method	Lecture + Numerical	Calculate horizontal and vertical distances
37	VI	Curves – Types, Designation & Setting by Offset Method	Lecture + Demonstration	Set out simple circular curves
38	VI	Rankine's Method of Deflection Angles	Lecture + Numerical	Apply Rankine's method
39	VII	EDM – Principle, Components & Applications	Lecture + Demonstration	Understand electronic distance measurement
40	VII	Electronic Theodolite & Total Station – Components and Function Keys	Demonstration	Operate modern surveying instruments
41	VII	Traversing, Profile Survey & Contouring Using Total Station	Practical Demonstration	Apply Total Station in field surveying
42	VIII	Remote Sensing – Principles, Applications & Drone Surveying	Lecture	Explain remote sensing techniques
43	VIII	GPS, DGPS & GIS – Components and Applications	Lecture + Demonstration	Understand GPS and GIS applications
44	VIII	Comprehensive Revision & Numerical Practice	Practice	Strengthen concepts and problem-solving skills
45	VIII	Final Revision, Doubt Clearing & Internal Assessment	Discussion/Test	Complete course assessment

27.06.26
Sign of Faculty

27/06/26
Sign of HOD
HOD, Civil Engg.
R.K. Institute of Engg. & Tech.
Kantapada, Niali, Cuttack

Principal
Sign of Principal
R.K INSTITUTE OF ENGG & TECH
KANTAPADA,NIALI CUTTACK