EASWARI ENGINEERING COLLEGE

(Autonomous)

Department of Civil Engineering

CORE TRAINING ON ADVANCE SURVEYING

TOTAL STATION AND DGPS

UNIT 1 : SURVEY BASICS AND INTRODUCTION TO TOTAL STATION

Definition of Survey – Types of Measurements – Conventional Instruments to Modern Instruments - Total Station – Principle - Parts and Accessories – Types of Total Station – Station setup: Centering & Levelling of TS - Job Creation - Instrument setup – Orientation – Measurement modes - Data Collection and Storage - Coordinate System - Sources of failure and its corrections.

UNIT 2 : FIELD ORIENTED SURVEY USING TOTAL STATION

Traverse and Contol point establishment – Topographic Survey –Missing Line Measurement (MLM) – Remote Elevation Measurement (REM) – Determination of Area and Volume – Column marking and refixing by Stake out / Setting out – Offset using Baseline method - DATAPROCESSING – TS PROJECTS - Import / Export – Triangulation and Processing of points – Contouring – Longitudinal Section and Cross Section of Road – FMB and Layout Separation – Column points generation

UNIT 3 : DIFFERENTIAL GLOBAL POSITIONING SYSTEM (DGPS)

Basics of GPS – Major segments – Types of Signals and Receivers – Accessories – Zone and Coordinate System - Difference between GPS and DGPS – Dilution of Precision - Biases and Solutions – Establishment of Bench Mark and Ground Control Points - Methods – Static – Real Time Kinematic (RTK) – GSM – Leapfrog.

UNIT 4 : POST PROCESSING – DGPS PROJECTS

File Transfer – Receiver Independent Exchange Format (RINEX) - Processing Methods – Real Time eXtended (RTX) – AUSPOS – Trimble Business Centre (TBC) Error Correction - Satellite View using Google Earth – Report Generation

UNIT 5 : DRONE SURVEY

Definition – unboxing of Drone -basic exterior parts and its function - Assembly of DRONE - safety operational tips - Control stick function and purpose - remote sticks, keys and their functions - flying of drones - Drone camera settings - calibration of drone and its need - photo and video formats and settings for image resolution - Definition - mapping software required - mapping software explanation - flight path drawing instruction and settings for image resolution - GCP – DGPS-RTK - drone ready to fly steps -data capturing - Photogrammetry software basics - icons and its explanation - step by step guide to process the data to create outputs- 2d and 3d orthomosaicmap - point cloud data – DEM – DTM – DSM– CONTOUR - File formats of output - conversionsoftware if any.

PRACTICALS

TOTAL STATION

1. Study of Total station and its accessories
2. Centering& Leveling
3. Distance, angle, Level Measurements.
4. Local Bench Mark Establishment
5. Total station Traversing
6. Land Topographical Survey
7. Road Topographical survey
8. Data Transfer cable/pen drive
9. Land Setting out survey
10. Road Setting out
11. Pile / column marking
12. Reference Line Survey
13. Area Calculation, MLM & REM
14. COGO (Coordinate Geometry)
15. Resection Survey
16. Data Processing

DGPS

1. Study of DGPS and its accessories
2. Configuration of DGPS
3. Bench Mark Establishment
4. Static Survey
5. Base and Rover Method
6. Data Transfer and Processing
7. R.T.K. Survey (Real Time Kinematic)
8. Topographical Survey
9. Route Identification Survey
10. Setting Out
11. COGO (Coordinate Geometry)
12. Data Exchange RINEX Output Format
13. Data downloading in Controller & Receiver
14. Post Processing

*Conducted Core Training titled "**Advanced Coordinates Based Survey**" for II Year Civil Engg. Students of Batch (2021-25) with the support of industrial experts from Land Coordinates Technology in month of Feb 2023.*