

## COURSE MODULES



### M1 Fundamentals of Surveying

Principles of land survey. Training in handling basic survey instruments.

### M2 Chain Survey

Linear survey methods. Measurement with the aid of chain and cross-staff. Preparation of sketches.



### M3 Using Prismatic Compass

Principles and use of prismatic compass, cardinal directions, magnetic bearings, deviation of the north indicated by compasses, the scope and accuracy in compass surveying.



### M4 Plane Table Survey

Principles and use of a Plane Table for producing an on-site drawing.



### M5 Dumpy Level

Principles and use of a Dumpy Level in surveying and building to transfer, measure, and set horizontal levels.



### M6 Theodolite

Principles and use of a Theodolite for measuring both horizontal and vertical angles, in surveying and engineering work.



### M7 Auto Level

Principles and use of an Auto Level in determining differences in height between two or more points, altitude and elevation.



### M8 Digital Level

A digital level is used where multiple levellings are needed. The staff and distance readings are displayed digitally and so the output is error-free.



### M9 Distomat

A distomat is used for electronic distance measurement (EDM). Students are trained to measure distances using the Distomat as well as the hand-held laser version which is mostly used for indoor measurements.



### M10 Digital Theodolite

Digital Theodolite uses opto-electronic scanning to determine absolute angle measurements. Students are trained to measure horizontal angle, vertical angle, percentage slope and compute values using the instrument.

### M11 Total Station

A Total Station consists of a theodolite with a built-in distance meter that can measure angles and distances simultaneously. Students are trained on using the Total Stations for following applications: Surveying, area (plan), free station surveys, tie distance, remote height, computations (COGO), longitudinal and traverse profiles, contour map, cut & fill volumes, staking out, cross section, reference line, road programmes.

### M12 Advanced Surveying using GPS



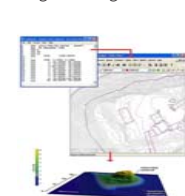
Compared to Total Station, GPS surveying offers the advantage that the points to be measured do not have to be mutually visible. Students are given an over view of GPS techniques and adequate exposure in the following areas using GPS: Control survey, static survey, mapping survey, stake-out, applied on network RTK, electrical wire survey, and road survey.

### M16 Hydrographic Surveying

In hydrographic survey investigations, observations of depth of water, water current and sea bed sample collection are some of the key activities performed. The results of these investigations are presented in the form of a hydrographic chart. These charts provide the information on depth of water at various points, contours showing spot height, ocean current, analysis of sea bed samples and similar data.

### S1 LisCAD

LisCAD is a software for the Engineer and Surveyor. Data from virtually any surveying instrument can be imported and turned into finished plans easily using LisCAD. The data base is designed to specifically support surveying and engineering tasks.

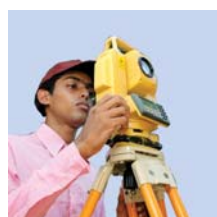


### S2 Auto Plotter

Auto Plotter converts the entire field data collected by the surveyor to a finished map or drawing.

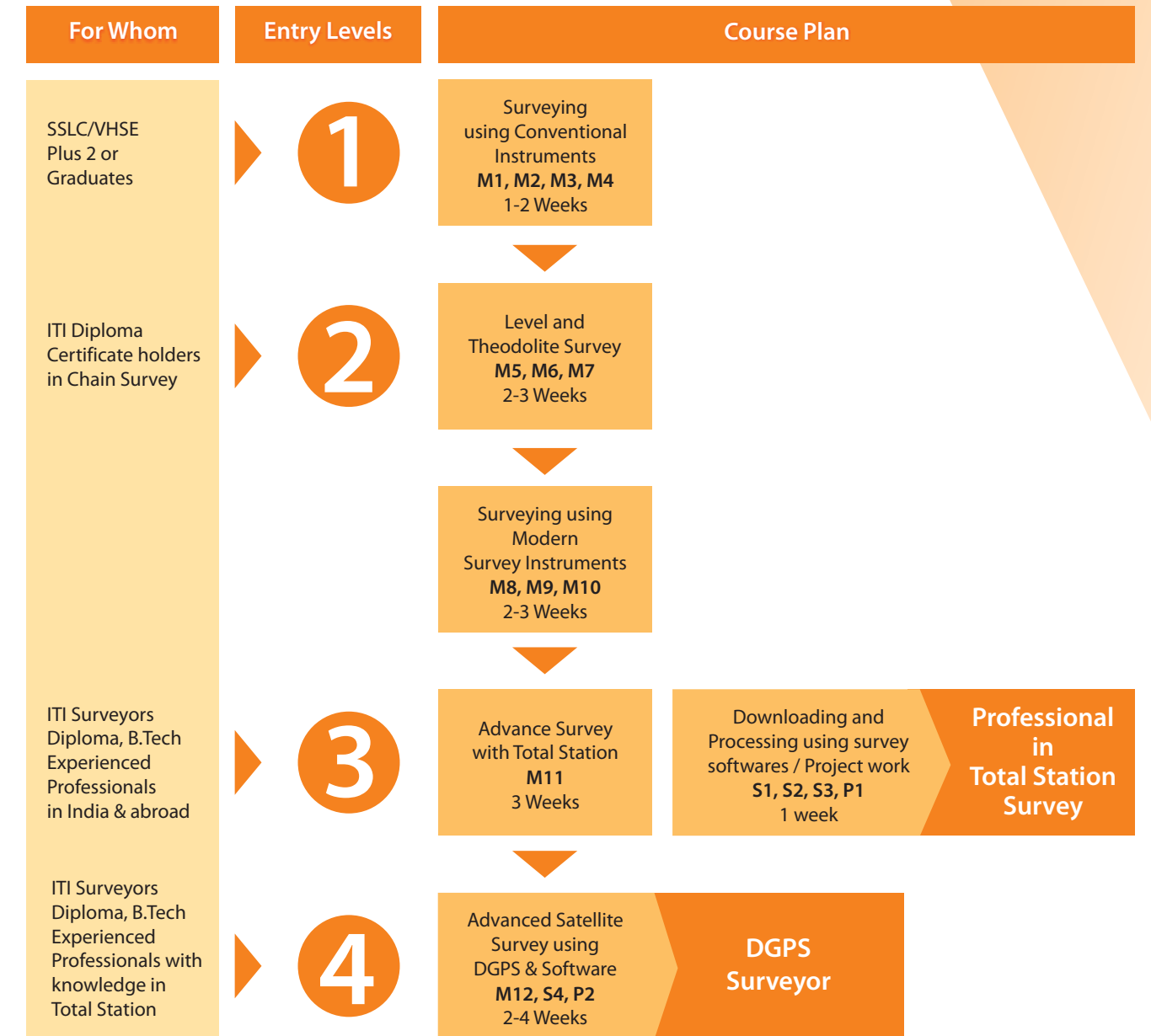
### S3 Road Estimator

Road Estimator is a specialty software designed for Surveyors and Engineers for the computation of earthwork on cut and fill situations in a new road alignment, quickly and easily. Computation of other items such as WBM, and Black-topping can also be made using the Road Estimator software.



## PROFESSIONAL COURSE IN ADVANCED SURVEYING LEVEL 1, 2, 3, 4

This is one of the most popular courses offered at V Institute, which trains the student to become a high quality professional surveyor equipped to handle state-of-the-art instruments and software applications. The course is so structured as to enable the students to enter the course at different levels depending on the basic educational qualifications attained by them.



### Course Path

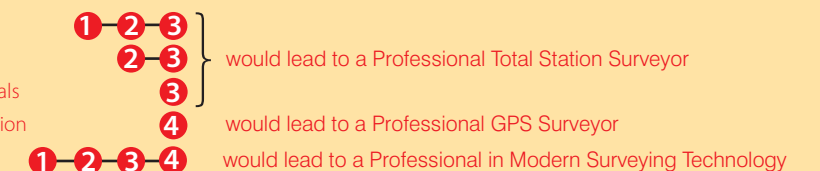
SSLC/VHSE/Plus 2/Graduates

ITI, KGCE Chain Surveys

ITI Surveyors/Diploma/B.Tech/Experienced professionals

ITI Surveyors/Diploma/B.Tech/Knowledge in Total Station

ITI Diploma/B.Tech (Ref Page 14)





## LEARN SURVEYING USING THE LATEST DIGITAL TOTAL STATION

This course is designed to prepare the students to handle sophisticated state-of-the-art survey equipment and to execute large survey projects. Knowledge in using Total Station offers careers in the following segments where total Station finds application:

**Surveying:** Survey and Land records (Field measurement book from 1970/digitization; Resurvey; Land acquisition)

**PWD/other Civil Organizations:** Levelling; Best fit alignment for new roads; Cut/Fill calculations

**Forestry:** Plantation Survey; Extent of encroachment, etc.

**Archaeological Survey:** Preparing global archaeological map, 3D models etc.

**Industries:** Ship building; Alignment of shafts; Building blocks; Aviation; Alignment of main shaft of aircraft

**Disaster Management:** Landslides; Dam settings; Dam monitoring, etc.

**Coastal Management:** Maintaining coastal zone

**Defence:** Construction; Missile launching azimuth

**Miscellaneous:** Satellite-azimuth observation; Antenna erection, etc.

### What is Total Station?

A Total Station consists of a theodolite with a built-in distance meter (dancer) that enables measurement of angles and distances at the same time.

Most electronic Total Stations today have an opto-electronic distance meter (EDM) and electronic angle scanner. The coded scales of the horizontal and vertical circles are scanned electronically, and then the angles and distances are displayed digitally. The horizontal distance, the height difference and the coordinates are calculated automatically and recorded.

Total stations are supplied with a software package that enables most survey tasks to be carried out easily, quickly and elegantly.

Total stations are used wherever the positions and heights of points, or merely their positions, need to be determined.

### Course Content

#### Applications covered in the Course

- Surveying
- Free Station Surveys
- Tie distance
- Road Design & Stake out
- Area (Plan)
- Remote Height
- Staking out
- Computation (COGO)
- Reference Line
- Longitudinal & Traverse Profiles
- Contour Map
- Cross Section
- Cut and fill volumes
- LisCAD
- AutoPlotter
- Road Estimator

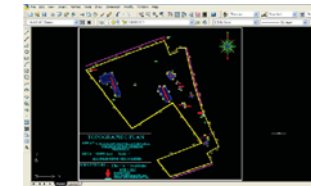
#### Major practical sessions covered in the Course based on overseas requirement

- Column alignments and column set-out (P1)
- Stake-out pile points with reference to existing structure (P2)
- Establishing new benchmarks and cross checking (P3)
- Lay out pipelines and marking inverted levels (P4)
- Lay out points for storage tanks (P5)
- Lay out transmission lines and bolt fixing (P6)
- Set out octagons, hexagons, circles, etc. (P7)
- Preparing Survey Reports to International Standards (P8)

## APPLICATION PROGRAMMES USING TOTAL STATION

### Surveying

The measurement of an unlimited number of points is supported by the Surveying programme.



### Area (Plan)

Application Area (Plan) computes the area of a given plot automatically and display after the boundary points are entered sequentially in the clockwise direction.



### Staking Out

This programme calculates the required elements to stakeout points from coordinates or manually entered angles, horizontal distance and heights.



### Free Station Surveys

This programme calculates the instrument station, along with the orientation of the horizontal circle, from measurements to at least two points, the co-ordinates, which are



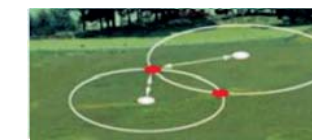
### Remote Height

The height difference H between the ground point and the high point can be calculated at the touch of a button.



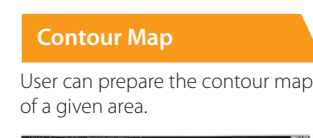
### Computations (COGO)

Create and edit and examine points, lines, splines, polygons, text and alignments. The WYSIWYG graphics lets you know exactly where you are.



### Cut & Fill Volumes

Calculate quantities to a base datum, or between surfaces. Additionally, height differences can also be calculated for evaluation or set-out on design projects.



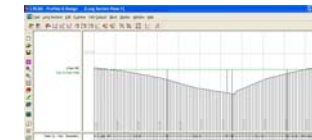
### Tie Distance

The application Tie Distance computes slope, distance, horizontal distance and azimuth of two target points measured on line, selected from the memory or entered using the keypad.



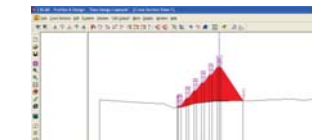
### Profiles & Design

Longitudinal and traverses form the basis for the detailed planning and stake out of communication routes for the calculation of fill and for the best possible accommodation of the routes to the topography.



### Cross Section

User can step through the cross sections along an alignment or go directly to a specific cross section.



### Contour Map

User can prepare the contour map of a given area.



### Major practical sessions conducted based on overseas requirements

#### Road Design & Stake-out

Uses straight line, Arc, Spiral and point to edit the plane and height design values of road. This function can conveniently decide the positions of mid line, border line and slope border according to the chainages on the road.



#### Reference Line

Facilitates easy setting out or checking of lines for buildings, straight sections of road, simple excavation etc.



Column alignments and column set-out (P1)



Stake-out pile points with reference to existing structure (P2)



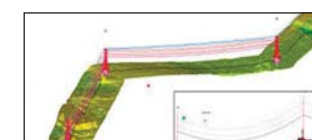
Establishing new benchmarks and cross checking (P3)



Layout pipelines and marking inverted levels (P4)



Layout points for storage tanks (P5)



Lay out transmission lines and bolt fixing (P6)



Set out octagons, circles, etc. (P7)