



KAMALDNP

kamaldnp.com • IT Training, Varanasi

PDF created by Raj Kamal using AI

Advance Surveying — Complete Syllabus

BTEUP Diploma in Civil Engineering • 4th Semester • Session 2026-27

Subject 4.3 (Theory) + 4.4 (Lab) • Total 200 Marks • 4 Credits

About this document: Advance Surveying appears twice in the 4th semester — as a theory paper (4.3) and as a lab (4.4). Both are covered here, completely, in the official order. (Spelling “Advance Surveying” is as printed in the PDF.)

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.3	Advance Surveying	Theory	2 - 0	2	Theory 40	Theory 60 (3 hrs)	100
4.4	Advance Surveying Lab.	Practical	0 - 4	2	Practical 60	Practical 40 (3 hrs)	100
Advance Surveying Total				4	100	100	200

What This Subject Aims To Do

To know the methods of plane table surveying and theodolite surveying and their uses, learn tachometric surveying and curve setting, understand the principles of electronic distance measurement equipment and total station and their use, and know the concept of remote sensing, GPS and GIS.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Plane Table Surveying	4	20%
2	Theodolite Surveying	6	20%
3	Tacheometric Surveying and Curve Setting	6	20%
4	Advanced Surveying Equipments	6	20%
5	Remote Sensing, GPS and GIS	6	20%

Unit 1 — Plane Table Surveying (4 Periods, 20%)

Topics: Principles of plane table survey; accessories of plane table and their use, telescopic alidade; setting of plane table; orientation of plane table — back sighting and magnetic meridian method, true meridian method; methods of plane table surveys — radiation, intersection, traversing and resection (two point and three point methods); merits and demerits of plane table survey.

Unit 2 — Theodolite Surveying (6 Periods, 20%)

Topics: Types and uses of theodolite, components of transit theodolite and their functions, reading the vernier of transit theodolite; technical terms — swinging, transiting, face left, face right; fundamental axes of transit theodolite and their relationship; temporary adjustment of transit theodolite; measurement of horizontal angle — direct and repetition method and reiteration methods; measurement of magnetic bearing of a line, prolonging and ranging a line, deflection angle; measurement of vertical angle; theodolite traversing by included angle method and deflection angle method; checks for open and closed traverse, calculations of bearing from angles; traverse computation — latitude, departure, consecutive coordinates, independent coordinates, balancing the traverse by Bowditch's rule and transit rule, Gale's traverse table computation; errors and precautions in theodolite surveying.

Unit 3 — Tacheometric Surveying and Curve Setting (6 Periods, 20%)

Topics: Principles of tacheometry, tacheometer and its component parts, anallactic lens; tacheometric formula for horizontal distance with telescope horizontal and staff vertical; field method for determining constants of tacheometer, determining horizontal and vertical distances with tacheometer by fixed hair method and staff held vertical, limitations of tacheometry; simple circular curve: basic definitions, designation of curves, types of curves used in roads and railway alignments; transition curves: definition and requirement; setting simple circular curve by offsets from long chord, tangent and Rankine's method of deflection angles; introduction of vertical circular curve.

Unit 4 — Advanced Surveying Equipments (6 Periods, 20%)

Topics: Principle of Electronic Distance Meter (EDM), its component parts and their functions, use of EDM; use of micro optic theodolite and electronic digital theodolite; use of total station, use of function keys; measurements of horizontal angles, vertical angles, distances and coordinates using total station, traversing, profile survey and contouring with total station.

Unit 5 — Remote Sensing, GPS and GIS (6 Periods, 20%)

Topics: Remote sensing — overview, remote sensing system, applications of remote sensing in civil engineering, land use / land cover, mapping, disaster management; use of Global Positioning System (G.P.S.) instruments; Geographic Information System (GIS): overview, components, applications, software for GIS; introduction to drone surveying.

Practical Work

- Use plane table survey to prepare plans of a plot of seven sided closed traverse by radiation method.
- Use plane table survey to prepare plans, locate details by intersection method and resection method (two point problem and three point problem).
- Use plane table survey to prepare plans, locate details by traversing method.
- Use plane table survey to carry out survey project for closed traverse for minimum five sides around a building.
- Use transit theodolite to measure horizontal and vertical angle by direct method.
- Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding theodolite survey project.
- Set out a circular curve by Rankine's method of deflection angles.
- Use EDM to measure horizontal distance.
- Use total station instrument to measure horizontal distances.

- Use total station instrument to measure vertical angle.
- Use total station instrument to carry out survey project for closed traverse for minimum five sides.
- Plot the traverse on A1 size imperial drawing sheet for the collected data from preceding total station survey project.
- Use GPS to locate the coordinates of a station.

Reference Books (as listed in the syllabus)

- Kanetkar, T. P.; Kulkarni, S. V., Surveying and Levelling Part I and II, Pune Vidyarthi Gruh Prakashan, Pune.
- Basak, N. N., Surveying and Levelling, McGraw Hill Education (India) Pvt. Ltd., Noida.
- Duggal, S. K., Survey I and Survey II, Tata McGraw Hill Education Pvt. Ltd., Noida.
- Saikia, M D.; Das. B.M.; Das. M.M., Surveying, PHI Learning Pvt. Ltd., New Delhi.
- D.V. Gupta, Vikram Singh, Land Surveying-II, Asian Publishers, Muzaffarnagar, ISBN: 978-93-91541-59-0.
- Subramanian, R., Surveying and Levelling, Oxford University Press, New Delhi.
- Punmia, B.C.; Jain, Ashok Kumar; Jain, Arun Kumar, Surveying Vol. I and Surveying Vol. II, Laxmi Publications Pvt. Ltd., New Delhi.
- Rao, P. Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHI Learning Pvt. Ltd., New Delhi.
- Venkatramaiah, C, Textbook of Surveying, Universities Press, Hyderabad.
- Anderson, James M and Mikhail, Edward M, Surveying theory and practice, McGraw Hill Education, Noida.
- De, Alak, Plane Surveying, S.Chand Publications, New Delhi.

KAMALDNP • kamaldnp.com • support@kamaldnp.com • +91 8318013442 • Varanasi, UP

Source: BTEUP 2nd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.

Please confirm with your own polytechnic for any local changes.