

LEVEL IV COURSES

4001- SURVEYING-I									
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)				
Lectures	Practical	Credits			Theory		Practical Ex.	Total	
3	4	7	25	25	3Hrs	100	50		200
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total
Nil		CVL		75	25	100	25	25	150

RATIONALE: - Surveying is one of the core subjects for civil engineering course where-in principles and methods of different types of survey are studied. The course content is designed to : Train the students to study and carry out surveying and levelling operations independently on the field; Develop the ability to apply knowledge to the solution of day to day problems on construction site; To develop the skills in handling various survey instruments.

COURSE CONTENTS		Hrs	Mks
1. INTRODUCTION	Scope of surveying, classification of survey, general principles of survey, scales and representative fraction.	2	4
2. LINEAR MEASUREMENT	Study of 20m and 30m chain. Degree of accuracy in chaining, errors due to incorrect length of chain and their corrections. Instruments for marking stations, ranging rods, pegs, arrows. Ranging – Direct and indirect ranging, chaining on a sloping ground, method of stepping.	6	12
3. CHAIN & CROSS STAFF SURVEYING	Chain triangulation – selection of survey stations, baseline, check-line, tie-line, taking offsets to locate ground features; Conventional signs on survey maps viz. cutting, embankment, marshy land, road, railway, stream, river etc, obstacles in chaining. (No numerical examples); Instruments used for setting perpendicular and their principles-optical square, open cross staff; Calculation of areas from recorded observations in chain and cross -staff survey.	10	20
4. CHAIN & COMPASS TRAVERSING	Open and close traversing; Bearing of a line – Fore bearing and back bearing, whole circle and quadrantal system, reduced bearing, conversion of bearings, finding included angles from bearings; Prismatic compass – Component parts, construction and use; Local attraction – Reasons, error due to local attraction, precautions to be taken, correction of bearings affected by local attraction; Traversing by chain and compass, included angle method, entering reading field book, plotting traverse and graphical adjustment for closing error.	12	24
5. LEVELLING	Definitions-Level surface, level line, horizontal line vertical line, datum surface, reduced level, benchmark-its types-temporary, permanent, GTS; Dumpy level- Components, line of sight, line of collimation, bubble tube axis, temporary and permanent adjustment; Study and use of tilting level, auto set level; Levelling staff- Telescopic and folding type; Terms used in levelling – Fore sight, back sight, Intermediate sight, change point and height of collimation; Recording in levelling book-Height of collimation method, rise and fall method, arithmetic checks and computation of missing readings; Classification of levelling-Simple, differential, profile levelling and cross- sectioning, fly levelling. Sources of errors, precautions to eliminate the errors.	15	34

6. MINOR INSTRUMENTS

3 6

Construction and use of Planimeter, Clinometer, Abney level and Sextant.

48 100

Total**PRACTICALS**

Study of 20m and 30m chain and its components, folding and unfolding of chain, Study of tapes, metallic and steel tape, ranging rods and their use, direct and reciprocal ranging, Study and use of Prismatic Compass- Calculation of included angles from observed bearings, Traverse survey- A compass survey of a closed traverse calculation of included-angles, Temporary adjustments of dumpy level and practice of simple levelling, Measurement of distance on a sloping-ground, Study of cross-staff and optical square and their use, Chain and cross staff survey and measurement of area, Study and use of dumpy level and levelling staff, Study and use of tilting level, Profile-levelling and cross-sectioning, Compound levelling-fly-levelling, Planimeter – Study and use for measuring areas. Abney level and Sextant – Study and use.

TERM WORK

Preparation of drawings on imperial size sheet based on the field-work and on the following projects- Chain-work and cross staff surveying for a closed traverse, Chain and compass traverse on a small area of minimum five sides, Profile levelling and cross-sectioning with dumpy level Base line of 300m long with cross section of 20m length.

REFERENCE BOOKS

1. Surveying & Levelling by Kanetkar & Kulkarni Vol. I & II
2. Surveying & Levelling by Purnima
3. Surveying & Levelling by Hussain & Nagraj
4. Surveying & Levelling by Bask N. N.