

	Course Title: <b>EXTENSIVE SURVEY CAMP/PROJECT</b>		
	Credits (L:T:P) : <b>0:2:4</b>	Total Contact Hours: <b>12 days+24hours</b>	Course Code: <b>15CE65P</b>
	Type of Course: Lectures, field work and office work	Credit : <b>03</b>	Core/ Elective: <b>Core</b>

**Prerequisites:** Knowledge of Surveying, Irrigation and Bridge Drawing, Water Resource Engineering, Highway Engineering and Town Planning.

The most important pillar of learning is “DOING”. Civil Engineer should be very conversant with the actual works of surveying, which this survey camp/project aims at the following course objectives

**Course Objectives of the survey camp works are:**

1. Apply knowledge of mathematics, science, and engineering to understand the measurement techniques
2. To train the students under difficult and realistic situation of the surveying project.
3. To acquire a sound practical knowledge and application of theory and in practical to overcome the difficulties that could arise in field during surveying.
4. The use of different survey instrument and to develop the team spirit at work
5. To impart training in the use of modern surveying instruments and to acquire a comprehensive idea of the project.
6. To impart confidence in the handling and management of the survey project.

**Course Outcomes**

On successful completion of this course, the student will be able to

Course Outcome		CL	PO	Teaching days
CO1	Experience hands on intensive training in the use of surveying instruments and performing various survey works in difficult terrain and to locate or identify sites necessary for conducting various surveys.	R U Ap Ay C	1 to 10	12 days + 2 hours / week*
CO2	Apply the knowledge of surveying in taking field observations pertaining to some of the realistic exposure to survey work such as concepts of reconnaissance survey, triangulation, contouring etc., gaining the ability to measure differences in elevation, draw and utilize contour plots.			
CO3	Appreciate the need for accurate and thorough note taking in field work to serve as a legal and produce the required maps and related calculations pertaining to survey work			
CO4	Develop the adaptability in conversant with the camp life, to communicate with the local population, to develop team spirit, community living and self-management.			
CO5	Adopt the working of Total station and Global Positioning System in the view of need for licensed surveyors.			

**\*Weekly 2 hours classes for quantity surveying of hydraulic structures, PHE structures, Cross drainage works (Culverts and bridge works) of drawings prepared in survey camp**



## Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments a practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
<b>EXTENSIVE SURVEY CAMP/PROJECT</b>	3	3	3	3	3	3	3	3	3	3

**Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.**

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If  $\geq 40\%$  of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If  $< 5\%$  of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

## ROADMAP FOR SURVEY CAMP

### Introduction

1. Students must follow the instructions given by the camp director/staff-in-charge.
2. Students must adhere to the dress code for the survey camp (Shoe, uniform, hat/cap).
3. Students must handle the instruments with at most care as instructed.
4. Instruments, accessories must be properly disassembled and handed over to the lab assistant.
5. The readings are to be done by the batch as grouped by the camp director/HOD and report should be submitted by each student.
6. Attendance at camp (briefings, lectures, field work and field tours, etc.) is mandatory.
7. Students should reach camp site on time; late students may not be allowed to participate.
8. The camp record shall include all original field observations, calculations and plots.
9. Instruction classes explaining about camp before commencement of camp being prepared will help you to finish the field work early.
10. Students and coordinator have to stay in the camp arranged by the camp director.
11. You may require to perform calculations after regular camp hours. Anticipate and adapt to any unexpected bad weather etc.
12. All reading must be noted using pen. Pencil should not be used in the field book except drawing sketch or diagram if needed.
13. Unnecessary colouring in the drawing should be avoided. Coloured lines should be as per code- Proposed line in green existing in red
14. Each batch must preserve the field book/Level book and hand over to the camp director/Staff-in-charge from your batch with the report at the end of semester.
15. Students will be evaluated on your ability to correctly complete the field work, calculations and analysis, as well as your ability to clearly communicate your methodology, results, and ideas to others.
16. All plots and drawings should be original (e.g. created by you, based on your experimental data).

17. Students must participate in the camp for all days as scheduled. Camp will not be arranged for the students who miss it.

### Batches

Each batch of student should be not more than 10

### Field work schedule

1. The students must come prepared for their sessions to complete the field work as scheduled.
2. Survey Camp of 12 days duration will be held immediately after V<sup>th</sup> semester at a Hilly Terrain.
3. The students are required to prepare the Topographical Map (Key plan) of the area by traditional method.
4. The purpose of the camp is to train students in using modern surveying techniques and equipment such as GPS, total stations, automatic levels, electronic theodolites, etc. to prepare a detailed digital map.

### Safety

Safety is our prime concern at all times. If your conduct is deemed to compromise safety regulations, you may be asked to leave camp and disciplinary action will be taken. Do not perform unauthorized experiments by yourself. Never leave the survey equipments unattended in the field. There must be no fooling around in the camp site. The students are strictly advised to wear shoes during the entire hours of the camp as a measure of safety

### Code of Conduct for Students

1. Instruments, ranging rods, pegs, arrow, staves etc have to be used only for field work purposes. Inappropriate use of the above such accessories will lead to disciplinary action/penalty.
2. Instruments must not be operated in a rough/violent manner.
3. Fire safety is extremely important.
4. Students causing damage will be required to pay for repairs.
5. No spray paints or other similar marking items are to be used unless as instructed by staff.
6. No persons are allowed to swim in the water. Do not leave bottles and cans in the field or by the lake. Do not litter; pick up any litter you may find
7. Canoes may only be used if equipment (safety devices, paddles, etc.) is signed in/out with a staff member.
8. If sufficiently serious, the breaking of a rule may also result in the person contravening them being evicted from the property Vehicles of students are not allowed within camp
9. Students should not leave the camp for any reason without the permission of coordinator
10. Keep camp neat and tidy. Return borrowed equipment's to their proper location
11. No one is permitted to cut or otherwise damage any living tree without the express permission of a course instructor.
12. Sleeping must be in the designated dorm arranged by program coordinator. Tents and other alternative sleeping arrangements are not permitted.
13. Any contravention of these rules may result in serious action

## COURSE CONTENT

Unit	Major Topics	Time schedule Allotted
1	Triangulation / Trilateration / Total Station (Determining area approximately 2 KM <sup>2</sup> )	1 day
2	New tank project	5 days
3	Highway project	2 days
4	Preparation of map of an existing village / Town / Layout.	2 days
5	Public Health Engineering-Water supply scheme and sewerage project.	2 days
6	Quantity Surveying of survey camp project	2 hours/ week

## DETAILED COURSE CONTENT

Unit	Major Topics	Time schedule Allotted
1	<p><b>TRIANGULATION WITH TOTAL STATION</b> ( Determining area approximately 2 KM<sup>2</sup> )</p> <ol style="list-style-type: none"> <li>1. Preparing map of given area.</li> <li>2. Calculation of area</li> <li>3. Total station traverse to yield adjusted coordinates of control points. ( determine the co-ordinates of few triangulation stations)</li> </ol> <p>Note: In case of non-availability of Total stations, Conventional methods can be adopted</p>	1 day
2	<p><b>NEW TANK PROJECT</b></p> <ol style="list-style-type: none"> <li>1. Reconnaissance of the area to be mapped. setting benchmark using GPS</li> <li>2. Fly levelling to establish T.B.M to the site&amp; fly-back levelling</li> <li>3. Fixing the alignment of <b>proposed bund</b>,</li> <li>4. Conduct profile leveling and cross sectioning along the proposed centre line of the tank bund.</li> <li>5. Capacity of reservoir by Radial contouring</li> <li>6. Calculation of capacity</li> <li>7. Block levelling at Sluice point of centre line of bund</li> <li>8. Block levelling for weir</li> <li>9. Canal Alignment Starting from sluice point with longitudinal sectioning and cross sectioning</li> <li>10. To determine the azimuth of a line, latitude and longitude of the place by taking extra-meridian observation on a sun.</li> </ol> <p>Use of GPS to determine latitude and longitude</p>	5 days

Unit	Major Topics	Time schedule Allotted
	<p><u>(Graded activities) Drawings to be prepared</u></p> <ol style="list-style-type: none"> <li>11. Index Map</li> <li>12. Contour map of water spread area with Capacity of reservoir calculations</li> <li>13. Longitudinal sectioning</li> <li>14. Cross sectioning</li> <li>15. Block levelling with contours showing weir details should consist of               <ol style="list-style-type: none"> <li>a. Half plan at top &amp; half plan at foundation.</li> <li>b. Half sectional elevation, half front elevation.</li> <li>c. Cross section of tank weir across the body wall.</li> </ol> </li> <li>16. Block levelling with contours showing sluice details should consist of               <ol style="list-style-type: none"> <li>a. Half plan at top &amp; half plan at foundation.</li> <li>b. Half sectional elevation, half front elevation.</li> <li>c. Cross section of tank weir across the body wall.</li> </ol> </li> <li>17. Canal cross-section of fully cutting, fully filled and Partial at different chainages</li> <li>18. Longitudinal sectioning of Canal at different chainages</li> <li>19. Plan of bund &amp; canal alignment showing location of hydraulic structures and various reduced levels</li> </ol> <p><u>Quantity surveying</u></p> <ol style="list-style-type: none"> <li>20. Earthwork calculation of bund.</li> <li>21. Earthwork calculation of canal.</li> <li>22. Estimation of weir positioned on block levelling.</li> <li>23. Estimation of Sluice positioned on block levelling.</li> </ol>	
4	<p><b>HIGHWAY PROJECT</b>( Terrain should be chosen such that it should include vertical &amp; Horizontal curve)</p> <ol style="list-style-type: none"> <li>1. Reconnaissance of the area</li> <li>2. Align a new road between two obligatory points.</li> <li>3. Conduct Longitudinal and cross-sectioning surveys</li> <li>4. Projecting a road of given gradient.</li> <li>5. Block leveling @ the lowest level or valley curve</li> <li>6. Connecting to new road alignment, surveying existing road 90m and exploring possibility of widening.</li> </ol> <p><u>(Graded activities) Drawings to be prepared</u> (Drawing should be preferably done using AutoCAD)</p> <ol style="list-style-type: none"> <li>1. Index plan</li> <li>2. Plan showing alignment of road</li> <li>3. L.S &amp; C.S of Road at different chainages as per IRC</li> </ol>	2 days

Unit	Major Topics	Time schedule Allotted
	<p>standards(Report should justify the selected alignment with details of all geometric designs for horizontal curve, traffic and design speed assumed.)</p> <p>4. Block levelling @ the lowest level or valley curve placing Culvert/Bridge</p> <p>a. Half plan at top &amp; half plan at foundation. b. Half sectional elevation, half front elevation. c. Half Cross section @centre half Cross section @ abutment</p> <p><u>Quantity surveying</u></p> <p>1. Calculate the earthwork involved by determining the cross-section of the highway at various intervals. 2. Quantity surveying of Proposed culvert/Bridge</p>	
5	<p><b>TOWN PLANNING PROJECT</b></p> <p>1. Town planning project new layout as per Zoning Regulations by using total station 2. Preparation of existing village map/layout</p>	2 days
6	<p><b>WATER SUPPLY AND SANITARY PROJECT</b>(Public Health Engineering)</p> <p>1. Examination of sources of water supply 2. Calculation of quantity of water required based on existing and future projected population for a village. 3. Preparation of village map and location of sites for ground level 4. Block leveling for overhead tanks 5. Underground drainage system surveys for laying the sewers. 6. Block leveling for Oxidation pond.</p> <p><u>(Graded activities) Drawings to be prepared</u></p> <p>1. Plan of water supply line, sewer lines in village map 2. Block leveling placing overhead tanks 3. Block leveling Placing Oxidation pond.</p> <p><u>Quantity surveying</u> Estimation of manhole Estimation of water supply line, Overhead tank</p>	2 days

Note:

1. At least one of the above should be done by using TOTAL STATION
2. The survey camp Report should be attached with field book, calculation sheets, all plans/drawings, estimates of earth work and structure in spread sheet and should be submitted in the form of Hardcopy and softcopy (CD)

**Course Delivery:** The course will be delivered through tutorials and practical's.

## Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment meth	CIE	IA	Students	Survey camp drawings and report.	15	Survey camp drawings and report + Annexure 1 (Field book and level books)	CO1,CO2, CO4,CO5
				Quantity surveying	10		CO3
	SEE	End Exam		End of the course	50	Answer scripts at BTE	CO1,CO2, CO3,CO4,CO5
Indirect Assessment	Student Feedback on course( Camp)		Students	During Survey camp		Feedback forms	1 & 2 Delivery of course
	End of Course Survey camp.			End of the Survey camp		Questionnaires	1,2,3,4,5Effectiveness of Delivery of instructions & Assessment Methods

For IA verification each batch coordinator should submit Annexure 1

Sl No	Scheme of End Examination	Marks
1	Survey camp Drawings & report including quantity surveying	20
2	Quantity Calculation for the given drawing	20
3	Viva-voce	10
<b>Total</b>		<b>50</b>

## REFERENCES

- 1 Punmia B C, Irrigation and water power engineering
- 2 Garg S K, Irrigation and water power engineering
- 3 Punmia B C, Ashok K Jain, Arun K Jain, Surveying Vol 1, 2,3, laxmi Publications(P) Ltd, New Delhi.
- 4 Justo C E G, A text book of highway engineering.
- 5 Kanetkar, A text book of surveying.

## ANEXURE 1

The survey camp of 20\_\_ – 20\_\_ was organized by....., for the fifth semester Diploma in civil engineering students, \_\_ in number. The duration of the camp was \_\_ days from \_\_.\_\_.20\_\_ to \_\_.\_\_.20\_\_ ..... The places in and around the \_\_\_\_\_ were chosen for surveying.

BATCH EVALUATION				
(INDEX)				
S.No	Date	Title	Rubrics rating out of 5	Staff Initial
E1.		Triangulations		
E2.		New tank project		
E3.		Highway project		
E4.		Town planning project		
E5.		Water supply and sanitary project		
E6.		Quantity Surveying of survey camp project		

Batch No : \_\_\_\_\_

S. No.	Register No	Student Name	Marks						Average
			E1	E2	E3	E4	E5	E6	
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									