Government of Karnataka
Department of Technical Education
Board of Technical Examinations, Bengaluru

	Course Title: **SURVEYING PRACTICE - I**		
	Credits (L:T:P) : **0:2:4**	Total Contact Hours: **78**	Course Code: **15CE23P**
	Type of Course: **Practical and Mini-Project**	Credit **: 03**	Core/ Elective: **Core**
CIE- 25 Marks			SEE- 50 Marks

Pre requisites: Practical knowledge of Basic Science and Mathematics in Secondary Education

Course Objective:

1. To provide knowledge of basic Principles of surveying.
2. Develop skills in using survey instruments, taking measurements and plotting the details

On successful completion of the course, the students will be able to:

Course Outcome		Experiments linked	CL	Linked PO	Teaching Hrs
CO1	Use of instruments in chain surveying and conducting experiments.	1 to 9	**U/Ap**	1,2,3,4,8,	**24**
CO2	Use of instruments in compass surveying and conducting experiments.	10 to 13	**U/Ap**	1,2,3,4,8	**21**
CO3	Use of instruments in levelling and conducting experiments on methods of levelling.	14 to 18	**U/Ap**	1,2,3,4,8, 10.	**21**
CO4	Conduct Longitudinal and cross sectioning for the given alignment and analyze the data by Block levelling (contours) prepare the drawings.	19,20	**U/Ap**	1,2,3,4,5, 8,9	**12**
CO5	Perform suggested activity related to surveying, exploring in groups and able to present it.	Suggested activity	**U/Ap/ Ay/C**	1 to 10	*
				Total sessions	**78**

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C:Creation E: Evaluation

*** Related to Student activity beyond classroom hours.**

Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Surveying practice -I	**3**	**3**	**3**	**3**	**3**	**1**	**1**	**3**	**1**	**2**

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 ≥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.

COURSE CONTENT

Sl. No	Experiments	Hours
CHAIN SURVEYING		
1	Study of instruments required for chain surveying.	**02**
2	Ranging and chaining a line	**02**
3.	Prolongation of a survey line	**02**
4	Practice of reciprocal ranging	**03**
5	Practice of different methods of Setting out perpendiculars	**03**
6	Set out Regular Polygons and compute its area	**03**
7	Practice of cross staff survey	**03**
8	Conduct traversing and record the data in the Field book	**03**
9	Obstacles in chaining	**03**
COMPASS SURVEYING		
10	Study of prismatic compass and surveyors compass	**06**
11	Taking bearings and finding the included angles by using prismatic compass	**06**
12	Set out regular and irregular Polygons using prismatic compass	**06**
13	Find the distance between two inaccessible points using Compass	**03**
LEVELLING		
14	Study of level and its temporary adjustments	**03**
15	Taking level of various points and recording it in a level book	**03**
16	Finding the difference in elevation between two points by Simple & Differential Levelling	**06**
17	Conduct Fly leveling to establish a Temporary BM and check its accuracy	**06**
18	Finding RL of given point by taking Inverted Staff Reading	**03**
19	Conduct Longitudinal and cross sectioning for the given alignment and plot it	**06**
20	Conduct Block Levelling for an area and plot Contours	**06**
	TOTAL	**78**

Course Delivery: The course will be delivered through lectures, Demonstration and practices

SUGGESTED ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Prepare a spread sheet of Rise and fall method or height of instrument method showing the calculation by using formula bar.
2. Layout Plan of Existing Campus
3. Contour Map of Existing Campus
4. Dividing the area into plots using town planning rules, and plot it
5. Carryout reciprocal levelling and make a presentation
6. Presentation on Precise levelling
7. Presentation on Digital levelling
8. Presentation on Digital ground model
9. Presentation on Data logger
10. Presentation on Triangular grid model
11. Presentation on Units of measurements used in survey from history
12. Sensitivity of bubble used in levelling
13. Two Peg Test
14. Three Wire Levelling
15. Permanent Adjustments of a Dumpy Level

NOTE:

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:
(Unsatisfactory **1,** Developing **2,** Satisfactory 3, Good **4,** Exemplary **5**)

2. Reports should be made available along with bluebooks to IA verification officer

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score (Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory **1**, Developing **2**, Satisfactory **3**, Good **4**, Exemplary5				
1.Literature	1				
2.Fulfill team's roles & duties	4				
3.Conclusion	3				
4.Convensions	5				
Total	13				
Average=(Total /4)	3.25=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity to attain last CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty

Dimension	Rubric Scale				
	1 Unsatisfactory	2 Developing	3 Satisfactory	4 Good	5 Exemplary
1.Literature	Has not included relevant info	Has included few relevant info	Has included some relevant info	Has included many relevant info	Has included all relevant info needed
2. Fulfill team's roles & duties	Does not perform any duties assigned	Performs very little duties	Performs partial duties	Performs nearly all duties	Performs all duties of assigned team roles
3.Communication	Poor	Less Effective	Partially effective	Effective	Most Effective
4.Convensions	Frequent Error	More Error	Some Error	Occasional Error	No Error

Course Assessment and Evaluation Scheme:

Method	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE*	IA	Students	Two tests (average of Two tests will be computed)	Test 1	10	Blue books	1,2
					Test 2			3,4
				Graded exercises (average of marks allotted for each graded exercise)		10	Record	1 2 3 4
				Suggested activity		05	Report	1,2,3,4,5
				Total		**25**		
	SEE*	End Exam		End of the course		**50**	Answer scripts at BTE	1,2,3,4
Indirect Assessment	Student Feedback on course		Students	Middle of the course			Feedback forms	1, 2 Delivery of course
	End of Course Survey			End of the course			Questionnaires	1,2,3,4,5 Effectiveness of Delivery of instructions & Assessment Methods

***CIE** – Continuous Internal Evaluation ***SEE** – Semester End Examination

Note: I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	**38**
2	Applying the knowledge acquired from the course	**30**
3	Analysis	**16**
4	Synthesis (Creating new knowledge)	**10**
5	Evaluation	**5**

Scheme of Valuation for End Examination

Sl No	Description	Marks
1	Writing procedure	05
2	Conducting & Performance	20
3	Calculation and results	10
4	Viva-voice	05
5	Record +suggested activity report	10
	Total	50

List of equipment:

SL NO	EQUIPMENTS	QUANTITY
1	Auto / quick setting / Dumpy level with accessories	05
2	Metric chains 30m	05
3	Arrows	50
4	Tape 15m	15
5	Tape 30 m	05
6	Ranging rods	25
7	Cross staff, French cross staff , open cross staff, line ranger, optical square, prism square,	05
8	Prismatic compass	05
9	Surveyor compass	02

TEXT BOOKS

1. Surveying and Levelling Vol- I & II by B C Punmia
2. Surveying and Levelling by T P konetkar & S V Kulkarni
3. Plane Surveying by Dr. Alak De
4. Surveying and Levelling by S S Bhavikatti
5. Surveying by Duggal
6. Surveying by R Agor
7. Fundamentals of Surveying by S K Roy
8. Surveying and Levelling by N N Basak
9. Advanced Surveying by R Agor

E-links

1. www.elearning.com/survey
2. http://nptel.ac.in/video.php?subjectId=105104101
3. http://media.sakshat.ac.in/NPTEL-IIT-Videos/
4. http://nptel.iitk.ac.in/courses/Civil_Eng/IIT%20Roorkee/Surveying.htm
5. http://nptel.iitk.ac.in/