

	Course Title: CONSTRUCTION PRACTICE		
	Credits (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code: 15CE56P
	Type of Course: Practices, Demo, Student activity	Credit :04	Core/ Elective: Core
CIE- 25 Marks		SEE- 50 Marks	

Pre-requisites: Knowledge of Materials of Construction, Construction Technology and Surveying.

Course Objective:

1. To give idea of basic setting out operations and construction of masonry units.
2. To estimate the quantity of steel reinforcement required for different elements of work
3. To realize the importance of form work, scaffolding and shuttering
4. To create awareness about various tests and repair methods used in buildings.

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

Course Outcome		Experiments linked	CL	Linked PO	Teaching Hrs
CO1	Plan setting out operations effectively ,estimate the amount of earth work and use various tools and safety equipments	1,2,3	R/ Ap/Ay/C/E	1,2,3,4, 5,8,9,10	12
CO2	Construct basic types of brick masonry arrangements and calculate the quantity of materials	4,5,6	R/ Ap/Ay/C/E	1,2,3,4, 5,6,8,9,10	15
CO3	Prepare bar bending schedules and estimate the quantity of steel required for various elements.	7,8,9,10,11	R/ Ap/Ay/C/E	1,2,3,4, 5,6,7,8,9,10	27
CO4	Perform plastering, painting, plumbing and repair works carried out at site..	12,13,14,15	R/ Ap/Ay/C/E	1,2,3,4,5,6 8,9,10	12
CO5	Recall the concept of water proofing, laying tiles, scaffolding, symbols ,sign conventions of traffic, architecture & should be in a position to supervise the same after the demo.	16,17,18,19	R/ Ap/Ay/C/E	1,2,3,4,5,6, 8,9,10	12
Total sessions					78
Legend- R; Remember U: Understand Ap: Application Ay: Analysis C: Creation E: Evaluation					



Mapping Course Outcomes with Program Outcomes

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
CONSTRUCTION PRACTICE	3	3	3	3	3	3	2	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.

EXPERIMENT NO	CONTENTS	HOURS
1	Study of construction tools, plumbing tools and sanitary fixtures,	3
2	Demonstration of safety kits and accessories used at construction site -Personal Protective Equipment (PPE).	3
3	Setting out center line for a small building, and estimate the quantity of earth work by LWS/Center line method	6
4	Construct One brick thick wall in English bond to a height of one meter in cement mortar including L-junction and T-junction (1 meter length) and also calculate the quantities.	6
5	Construct One and half thick brick wall in English bond to a height of one meter in cement mortar.	6
6	Construct One and half Brick thick pillar to a height of one meter in cement mortar.	3
7	Prepare Bar bending schedule & Fabrication of reinforcements for a Doubly Reinforced beam	6
8	Prepare Bar bending schedule & Fabrication of reinforcements for a Two way slab	6
9	Prepare Bar bending schedule & Fabrication of reinforcements for a lintel with chejja	3
10	Prepare Bar bending schedule & Fabrication of reinforcements for a column with footing	6
11	Fabrication of timber or steel formwork for a monolithically casted beam and slab. (Procedure, Sketch, Tools, Observation Tabulation & Calculation of quantity of materials required only).	6
12	Plastering for a new masonry wall surface (1 square metre area) with CM (1:6)	3
13	Painting for a given area (1 square meter area).	3
14	Fixing of doors and windows	3
15	Prepare a plan for PVC pipe layout using valves, fixtures, adhesive solvents and fittings from over head tank to wash basin/tap and execute it.	3
Demo only		
16	Water proofing for roof & crack inhibition methods (Grouting) in buildings	3
17	Laying of floor tiles	3
18	Construction of Single and Double Scaffolding	3
19	Study of Symbols and sign conventions related to Architecture – Traffic – Electrical Circuits - Plumbing & welding	3

COMPULSORY SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage. Student has to be assigned with activities in below mentioned areas. Each student must be able to get the exposure of mentioned items.

SL NO	Items	EXPOSURE UNDER FOLLOWING ITEMS	REPORTS TO BE COLLECTED/PREPARED
1	EXCAVATION FOR BUILDING	<ol style="list-style-type: none"> 1. Setting out corner benchmarks. 2. Survey for ground levels. 3. Excavation to approved depth. 4. Dressing of loose soil. 5. Constructing dewatering wells and interconnecting trenches. 6. Marking boundaries of the building. 7. Constructing protection bunds and drains 	<ol style="list-style-type: none"> 1. Checklist for- excavation 2. Plans of ground levels (block levels) 3. Plan and sections of architectural good for construction drawing 4. Reference coordinates buildings/blocks coordinates' .w.r.t total station. 5. soil investigation report 6. Photos and videos of the group under training 7. Weekly Progress report of implant training 8. Methodology 9. Specifications 10. List of tools and equipment used 11. Various Tests on materials 12. Frequency of material testing 13. Test reports 14. Stages of inspection
2	ANTI TERMITE TREATMENT	<ol style="list-style-type: none"> 1. Methodology 2. Types of anti-termite 3. Anti termite treatment will be done in 3 stages- 4. Before foundation PCC 5. Before plinth PCC 6. Periphery of the building before flagging course. 	<ol style="list-style-type: none"> 1. Checklist for- ANTI TERMITE TREATMENT 2. Weekly Progress report of implant training 3. Methodology 4. Specifications 5. List of tools and equipment used 6. Various Tests on materials 7. Frequency of material testing 8. Test reports 9. Stages of inspection
3	SOLING	<ol style="list-style-type: none"> 1. Preparation of sub grade 2. Laying and Packing of Soling Stones 3. Consolidation of Soling 	<ol style="list-style-type: none"> 1. Checklist for- SOLING 2. Weekly Progress report of implant training 3. Methodology 4. Specifications 5. List of tools and equipment used 6. Various Tests on materials 7. Frequency of material testing 8. Test reports 9. Stages of inspection
4	PLAIN CEMENT CONCRETE	<ol style="list-style-type: none"> 1. Excavation dimensions, depth of excavation as per required RL and gridlines will be checked before start of PCC and necessary shuttering will be done. 2. Tools required like panja, rammer etc. compaction manually or mechanical compactors. 3. will be ensured before start of work. 4. Grade of concrete will be C.C.1:4:8 or as per the 	<ol style="list-style-type: none"> 1. Checklist for PLAIN CEMENT CONCRETE 2. Level Records to be of final excavated area. (For individual footings).

SL NO	Items	EXPOSURE UNDER FOLLOWING ITEMS	REPORTS TO BE COLLECTED/PREPARED
		<p>specifications.</p> <p>5. After setting of the PCC, curing of concrete will be done by sprinkling water on it for 15 days.</p>	
5	FOOTING CONCRETE	<ol style="list-style-type: none"> 1. Shuttering procedure 2. Concreting procedure 3. Reinforcement procedure 4. Detailing of reinforcement 5. Curing procedure 	<ol style="list-style-type: none"> 6. Checklist for footing concrete 7. Cube register. (page) 8. Bar bending schedule 9. Pour card 10. List of tools and equipments used
6	COLUMN CONCRETE	<ol style="list-style-type: none"> 1. Starter Concreting 2. Reinforcement 3. Detailing of reinforcement 4. Shuttering 5. Scaffolding 6. Concreting 7. Curing 	<ol style="list-style-type: none"> 1. Checklist for column concrete 2. Cube register. 3. Bar bending schedule 4. Pour card
7	EARTH FILLING	<ol style="list-style-type: none"> 1. The maximum dry density and optimum moisture content of the approved soil for backfilling will be calculated by doing Proctor test. 2. The earth transported and dumped 3. Care shall be taken that the loose depth of filling is not more than 300 mm. 4. 8-10T roller shall be passed over loosely filled soil to get 200mm thick compacted fill. 5. water to sprinkle shall be decided practically depending upon the core tests. 6. compacted by using steel rammers and plate compactors. 7. Core cutter tests 	<ol style="list-style-type: none"> 1. Checklist for BACK FILLING 2. Approval of Quality of soil. 3. Level Record 4. Records to be of core tests
8	PLINTH BEAMS	<ol style="list-style-type: none"> 1. Reinforcement 2. Shuttering 3. Detailing of reinforcement 4. Scaffolding 5. Concreting 6. Curing 	<ol style="list-style-type: none"> 1. Checklist for plinth beam concrete 2. Approval of Quality of soil. 3. Level Record <p>Records to be of core tests</p>
9	ROOF SLAB CONCRETE	<ol style="list-style-type: none"> 1. Form work 2. Reinforcement 3. Detailing of reinforcement 4. Construction Joint 5. Production and placement of concrete 6. Curing 	<ol style="list-style-type: none"> 1. Checklist for slab casting 2. Approval of Quality of soil. 3. Level Record <p>Records to be of core tests</p>
10	CONCRETE BLOCK MASONRY	<ol style="list-style-type: none"> 1. Materials:-Blocks, Mortar, Sand, Cement 2. Workmanship 3. Curing 	<ol style="list-style-type: none"> 1. Checklist for Block Masonry 2. Quality approval of blocks

SL NO	Items	EXPOSURE UNDER FOLLOWING ITEMS	REPORTS TO BE COLLECTED/PREPARED
11	WOODEN & ALUMINIUM DOOR/WINDOW /VENTILATORS FRAMES PANNELED DOOR SHUTTERS/ FLUSH DOOR SHUTTER	<ol style="list-style-type: none"> 1. The sectional drawings 2. Bull marks” or “thiyas” 3. Arrangement for hold fasts 4. Check for common top Level of frames and its true plumb & line 5. Rebate notch provided in frame and shutter thickness will be matching. 6. Check the opening side of shutter before fixing frames 7. Horizontal bracing 	Checklist for- DOOR/WINDOW/VENTILATORS FRAMES AND SHUTTERS
12	TOILET WATER PROOFING	<ol style="list-style-type: none"> 1. chemical surface 2. The sunken portion 3. A coat of waterproof plastering 4. Corner concrete 5. Screed concrete 6. Curing. 	<ol style="list-style-type: none"> 1. Checklist for Toilet water proofing 2. Quality approval of chemicals
13	TERRACE WATER PROOFING	<ol style="list-style-type: none"> 1. Water proofing agent. 2. The slope 3. The finishing course 4. Insulation or under bed. 5. Water test 	<ol style="list-style-type: none"> 1. Checklist for terrace water proofing 2. Quality approval of chemicals
14	PLASTERING – INTERNAL & EXTERNAL	<ol style="list-style-type: none"> 1. Material 2. Workmanship 3. External and internal plaster 4. Scaffolding 5. Curing 	Checklist for Plastering
15	TILE WORK FLOORING Or TILING	<ol style="list-style-type: none"> 1. TILES: The type, quality, size, thickness and colour of tiles for flooring, 2. Procedure for LAYING 3. SKIRTING AND DADO 4. CURING: 	Checklist for- TILING
16	PAINTING WORKS	<ol style="list-style-type: none"> 1. Painting Works 2. General Specifications 3. For Gypsum Plaster Surfaces- 4. For Cement Plaster Surfaces: 5. Colour Wash 6. Cement Paint 	Checklist for- PAINTING

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, Exemplary5)
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, Exemplary 5				
1. Organisation	1				
2. Fulfill team's roles	4				
3. Conclusion	3				
4. Conversions	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 on any one 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. Conversions	Frequent Error	More Error	Some Error	Rare Error	No Error

Course Assessment and Evaluation Scheme:

Direct Assessment method	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
	CIE	IA					
Direct Assessment method	CIE	IA	Students	Twice test (average of two tests)	10	Blue books	CO1,CO2
				Test 1	10		CO3,CO4,CO5
	Graded exercises	10		Record		All CO's	
	Suggested Activity	05		Reports	All CO's		
SEE	End Exam		End of the course	50	Answer scripts at BTE	CO1,CO2,CO3,CO4,CO5	
Indirect Assessment	Student Feedback on course		Students	Middle of the course	---	Feedback forms	CO1,CO2 Delivery of course
	End of Course Survey			End of the course	---	Questionnaires	CO1,CO2,CO3,CO4,CO5 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.
- Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

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

Sl. No	Bloom's taxonomy	% Weightage
1	Remembering and Understanding	10
2	Applying the knowledge acquired from the course	60
3	Analysis	10
4	Synthesis (Creating new knowledge)	10
5	Evaluation	0

Sl No	Scheme of End Examination	Marks
1	Procedure, Sketch, Tools, Observation,	10
2	Tabulation & Calculation of quantity of materials required	10
3	Conducting exercise	10
4	Record, Mini project report on suggested activities	10
5	Viva-voce	10
Total		50

Note: Record & Report on suggested activities are mandatory during SEE.

Reference Books

- 1 A textbook of Building construction - Bindra & Arora (Dhanpat Rai & Sons Delhi - 6)
- 2 A text book of Building construction - Sushil Kumar (Standard publishers)
- 3 S.P.34 BIS Publication
- 4 A text book of Structural Design & Drawing - Singh (India publishing house)
- 5 A text book of Practical Building construction - Mantri (Mantri publications)
- 6 Plumbing by A. Johnson
- 7 Plumbing instruction and design by L.V. Ripka
- 8 Plumbing by Harald E Babit
- 9 Plumbing by John H Inns

List of Equipments

Sl.No	Equipment Name	Quantity
1	Trowel	15
2	Mortar pans	20
3	Plumb bob	15
4	Shovel	05
5	Spades	05
6	Pick axes	10
7	Bar bending table	02
8	Wire brush	05
9	Spirit level	05
10	Tubular scaffolding	02 units
11	Tri square	05
12	Bar bending tools	02 sets
13	Ultra sonic pulse velocity test equipment	01 set
14	Personal protective equipment	02 sets
15	Grouting hand pump with nozzle	02 sets
16	Plumbing tools kit	02 sets
17	Valves different sizes	06 No's
18	Pipe wrench	05 No's
19	Plumbing and sanitary fixtures, fittings	05 sets
20	Threading die set	02 No's
21	Model of door and window with fastenings	01 Each
22	Symbols and sign conventions charts related to Architecture – Traffic – Electrical Circuits - Plumbing & welding	01 set
23	Brushes and rollers of different sizes	03 set
24	Sand paper	03 set
25	Scrappers	03 set
26	Mixing pan	03 set
27	Putty blades	03 set

