Semester	**: IV**	
Course No.	**: FS-243**	**Credit Hrs. : 2(1+1)**
Course Title	**: Building Construction and Cost Estimation**	

SYLLABUS

Objectives : (i) To make the students get acquainted with the methods of construction of agricultural buildings,

(ii) To enable them to prepare various types of estimates of buildings.

THEORY

Building Materials: Description of important building materials, rocks, different stones; Formation of stones, types of stones, quarrying process, stone products and uses; Bricks, types, preparation and burning of bricks, properties and uses; Tiles, types and classification; Lime, properties and uses, cement, different uses and grades.

Concrete: Grades, preparation, mixing and laying of concrete, use of sand; Use of Ferrous material, Iron and Steel products; Use of non-ferrous metals, glass, rubber, plastics, Aluminum, Copper, Nickel; Timber and its uses, seasoning, defects, commercial form of timber, miscellaneous building materials.

Building Construction: Building components, foundations, brick work, lintels, columns, roofs and stair cases, different types of floors, plastering and pointing, damp proofing and waterproofing, white washing, distempering and painting, steps for building construction, needs of different agricultural buildings, types and uses, types of roofs, slope and flat roof buildings.

Estimating and Costing: Types of estimates, rough cost, detailed and supplementary estimate, Preparation of cost estimates, cost analysis, schedule of rates, analysis of rates, factors affecting building costs, building codes, estate development.

Cost Economics: Measurement and pricing, Economic methods for evaluation of buildings, Benefit cost calculation, Rate of return period (Payback period).

TEACHING SCHEDULE

THEORY [FS-243]

Lecture No.	Topic	Sub-topics / Key Points	Weightage (%)
1 - 2	**Building Materials**	Description of important building materials.	25
	Rocks and Stones	Different stones; Formation of stones, Types of stones, Quarrying process, Stone products and Uses.	
	Bricks	Types, Preparation and burning of bricks, Properties and Uses.	
	Tiles	Types and Classification.	
	Lime	Properties and Uses.	
3	**Cement, Concrete**	Different uses and grades. Grades, Preparation, Mixing and Laying of concrete, Use of sand. Use of Ferrous material, Iron and Steel products; Use of non-ferrous metals, Glass, Aluminum, Copper, Nickel.	25
4	**Timber**	Timber and its Uses, Seasoning, Defects, Commercial form of timber.	
5	**Miscellaneous Building Materials**	Rubber: Types, Uses. Plastic: Types, Uses.	
6 -7	**Building Construction**	Steps for building construction, Foundations, Brick work	25
8	**Building Components**	Lintels, Columns, Roofs and Stair cases	
9	**Floors**	Different types of floors	
10	**Plastering and Pointing**	Types, materials, application methods used in Plastering and Pointing	
11	**Distempering and Painting**	Damp proofing and waterproofing, White washing, distempering and painting	
12	**Needs of different Agricultural Buildings**	Needs of different agricultural buildings, Types and Uses	25
13	**Roofs**	Types of roofs, Slope and flat roof buildings	

Continued…

14 - 15	**Estimating and Costing**	Types of Estimates, Rough cost, Detailed and supplementary estimate, Preparation of cost estimate, Cost analysis, Schedule of rates, Analysis of rates, Factors affecting building costs, Building codes, Estate development.	
16	**Cost Economics**	Measurement and Pricing, Economic methods for evaluation of buildings, Benefit Cost calculation, Rate of Return period (Payback period).	
		Total =	**100**

TEACHING SCHEDULE

PRACTICAL [FS-243]

Exercise No.	Exercise Title
1	Study of different types of rocks.
2	Study of water absorption of stone and brick materials.
3	Determination of soundness of cement by Le Chatelier apparatus.
4	To determine fineness of cement.
5	Test of adhesiveness of mortar to building units.
6	To determine standard consistency of cement.
7	To determine initial setting time of cement.
8	Preparation of concrete using various ingredients.
9	To test workability of cement by Slump cone method.
10	To test workability of cement by Compaction factor method.
11	Determination of Bulking of sand and silt content in the sand.
12	To determine void ratio and bulk density of fine aggregate and course aggregate.
13	Study of market forms of timber.
14	Measurement of components of an agricultural structure.
15	Preparation of an estimate of agricultural structure.
16	Visit to a Construction Site and to Brick kiln / Cement factory/ Stone quarry / Other Building material.

Suggested Readings [FS-243]:

1. Punmia B.C., Jain A.K. and Jain A.K. 1984. Building Construction. Laxmi Publications (P) Ltd., New Delhi.
2. Duggal S.K. 2012. Building Material. New Age International Publishers.
3. Sane Y.S. 1964. Planning and Designing of Buildings. Engineering Book Publishing Co., Pune.
4. Rangwala S.C. 1994. Engineering Materials. Charotar Publishing House, Anand.
5. Dutta B.N. 2000. Estimating and Costing. UBS Publishers.