

COURSE NAME: Civil Engineering Group **COURSE CODE:** CE /CS /CR/CV

SEMESTER : Third

SUBJECT TITLE : Building Construction **SUBJECT CODE:** 9019

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME			EXAMINATION SCHEME						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
04	--	02	03	80	20	--	--	25@	125

Rationale:

Building construction is a core subject in civil engineering. This subject is intended for gaining useful knowledge with respect to facts, concepts, principles and procedures related to building construction system so that student can effectively plan, execute building construction work and carry out repairs and maintenance of existing building with quality in construction.

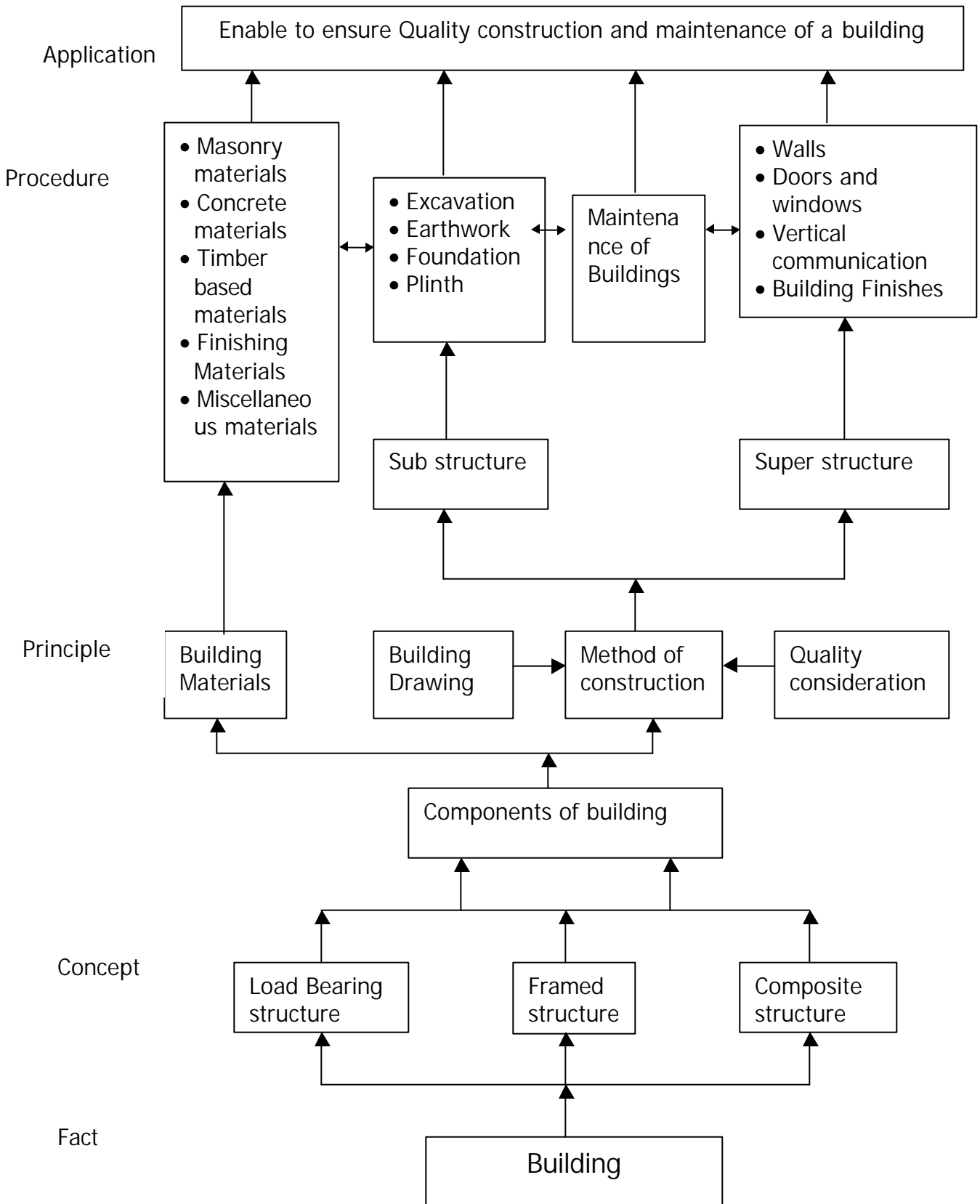
The subject helps to learn building materials required for construction. It provides necessary knowledge about properties, uses and market rates of building materials.

Objectives:

Student will be able to :

1. Identify various components of buildings and their functions.
2. Mark layout of building on ground.
3. Know the procedure for execution of various construction activities.
4. Check line, level and plumb of various construction activities.
5. Prepare checklist of operations for supervision of various construction activities.
6. Identify & suggest rectification the various defects in civil engineering works.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Building Components and Materials 1.1 Building Components and types of Structure Building components & their function. Substructure – foundation, Plinth. superstructure – walls, Sill, lintel, Doors & Windows, Floor, roof, parapet, beams, columns. Types of Structures – Load bearing Structures, framed Structures, composite structures.	10	12
	1.2 Masonry Materials a) Building Stones- Classification of rocks, Requirement of good building stone, dressing of stones, quarrying of stones ,artificial or cast stones b) Bricks– conventional bricks , standard bricks composition of clay brick, strength of bricks, Proportions of burnt clay bricks , testing of bricks , special bricks ,hollow blocks , fly ash bricks. c) Mortars – classifications, Lime mortar, cement mortar, special mortars. Functions of mortar, proportions, properties of mortar and tests for mortar.		
	1.3 Timber based Material Use of timber, Characteristics of good timber, defects in timber, Plywood, particle board ,veneer, sun mica , fore mica, Nuwood, artificial timber, rubber wood.		
	1.4 Miscellaneous Materials Glass, plastic, fibers, aluminum, steel , galvanized iron, asphalt bitumen etc .micro silica, PVC, CPVC, PPF. Waterproofing and termite proofing materials, admixtures in concrete, bonding agents, epoxy resins, polishing materials etc		
02	Construction of Substructure 2.1 Job layout Site clearance, preparing job layout, layout for load bearing structure and framed structure by center line and face line method, precautions while marking layout on ground .	10	16

03	<p>2.2 Earthwork Excavation for foundation, timbering and strutting Earthwork for embankment material for plinth filling. Tools and plants used for excavation and earthwork.</p>	24	26
	<p>2.3 Foundation Types of foundation – Open foundations, shallow foundation, stepped foundation, isolated and combined column footing, raft foundation, deep foundation and Pile foundation. Pumping method of dewatering, cofferdams. Bearing capacity of foundation soil, Under reamed pile foundation.</p>		
	<p>Construction of Superstructure</p>		
	<p>3.1 Stone Masonry Terms used in stone masonry – Facing, backing, hearting, through stone, corner stone. Uncoursed rubble masonry, coursed rubble masonry, point to be observed in construction of stone masonry, mortars for stone masonry, tools and plants used for stone masonry, Col-grout masonry.</p>		
	<p>3.2 Brick Masonry Common terms used in brick masonry, Requirements of good brickwork, bonds in brick masonry, English, Flemish, Stretcher and header bonds only. Brick laying ,Line level and plumb of brickwork, striking and raking of joints, lead and lift, precautions in brick masonry, tools and plants used in brick masonry . Comparison between brick and stone masonry. Hollow concrete block masonry, composite masonry , Cavity wall- purpose and construction.</p>		
	<p>3.3 Doors and Windows</p>		
	<p>Doors -Components and construction of panelled doors, battened doors, flush doors, collapsible doors, rolling shutters, Revolving doors, Glazed doors. Sizes of door.</p>		
	<p>Windows -Component and construction of fully panelled, partly panelled and glazed, glazed wooden, steel, Aluminum windows, sliding windows, louvered window, ventilators, cement grills. Protective treatment for doors and windows, fixtures and fastenings for doors and window.</p>		
	<p>Sill, lintel and weather shed - functions, types and construction .</p>		
	<p>3.4 Vertical Communication Means of vertical communication – Stair case, Elevator or</p>		

	of good staircase, Types of staircase, Fabricated stair.		
	3.5 Scaffolding and shoring Purpose, Types of scaffolding, process of erection and dismantling. Purpose and types of shoring, Underpinning, safety precautions.		
	4. Building Finishes 4.1 Floors and Roofs Floor finishes- shahabad , kota, marble, granite ,Kadappa, Ceramic tiles ,vitrified , mosaic tiles ,chequered tiles, glazed tiles ,pavement blocks , concrete floors, tremix floor, skirting and dado. Process of laying- Process of laying and construction, finishing and polishing of floors. Roofing materials – AC sheets ,G.I. sheets, plastic sheets, fibre sheets, Mangalore tiles etc. Steel trusses. R.C.C. slab		
	4.2 Wall finishes Plastering – Necessity of plastering, Single coat plaster Double coat plaster , Neeru finishing and POP, special plasters stucco plaster , plaster board and wall claddings. Precaution to be taken while plastering. Defects in plaster. Pointing – Necessity and procedure of pointing. Painting – Necessity, Surface preparation, method of application, selecting suitable painting material, white wash and colour wash.		
	5. Building Maintenance 5.1 Cracks Causes and types of cracks, identification and repair of cracks. Guniting and grouting, use of epoxy and crack fills.		
	5.2 Settlement Settlement --causes and remedial measures Plinth protection – Necessity and materials used.		
	5.3 Demolition Necessity, method of demolition-hand demolition, machine demolition, controlled blasting demolition, Precautions during demolition.		
	5.4 Rebaring techniques Necessity and equipment for Rebaring techniques		
	Total	64	80

CONTENT: PRACTICALS-

SKILLS TO BE DEVELOPED :-

1. **Intellectual Skills:-** Students will be able to
 - a) Identify components of a building.
 - b) Differentiate and identify types of building materials .
 - c) Select appropriate material for building construction.
 - d) Supervise the building construction activities.
2. **Motor Skills :-** Students will be able to.
 - a) Mark Layout of building on the ground.
 - b) Check and mark various levels in building.

LIST OF PRACITCAL:

1. Preparing foundation plan and marking on ground layout of load bearing structure by face line method from the given plan of the building.
2. Preparing foundations plan and marking on ground layout of framed structure by face line method from the given plan of the building.
3. Checking and transferring line and level of plinth, sill, lintel, flooring, slab level of a building and writing report of the process.
4. Checking verticality (plumb line) of formwork for column, beam and wall at construction site and writing report of the process.
5. Laying and constructing the process of construction of brickwork and report writing of the process.
6. Observing the process of painting in residential / public building and writing a report with reference to process and type of paint selected.
7. Observing and writing report of the process of plastering.
8. Observing and writing report of the process of water proofing of terrace or basement.
9. Observing the models, specimen of building materials kept in the model room for few building items and writing a report for any five models/materials.

LEARNING RESOURCES:

REFERENCE BOOKS:

Sr. No.	Title	Author	Publisher
1	Construction Materials	D.N. Ghose	Tata McGraw-Hill
2	Building materials	Amarjit Agrawal	New India Publication
3	Building materials	S. K. Duggal	New Age International
4	Engineering materials	Sharma	PHI Publication
5	Building Construction	S. P. Arora and Bindra	Dhanpat Rai Publication
6	Building Construction	S. C. Rangawala	Charotar Publication
7	Building Construction	Sushil Kumar	Standard Publication
8	Building Construction	B. C. Punmia	Laxmi Publication

9	Building Construction	S.K. Sharma	Tata McGraw-Hill
10	Civil Engineering materials	TTTI ,Madras	TTTI ,Madras
11	Building Construction	Dr.Janardan Zha	Khanna Publication
12	A to Z of Building Construction	Mantri Construction	Mantri Publication
13	Building Construction Vol. I to IV	W. B. Mackay	Longman(ELBS)

HandBooks:

Sr. No.	Title	Author	Publisher
01	PWD Handbooks for -Materials - Masonry -Building -Plastering and Pointing - Foundation	Govt. of Maharashtra	Govt. of Maharashtra
02	Practical Civil Engineering Handbook	Khanna	Khanna Publication

BIS/ International Codes of Practice:

Sr. No.	Title
01	National Building Code
02	BIS 962-1973 Code of Architectural and Building Drawing
03	BIS 1256-1967 Code for Building Byelaws
04	BIS 1038- 1983 Steel Doors, Windows and Ventilators

Software:

01	SuperCivil CD
02	MSBTE CAI Learning Package