

RGPV (DIPLOMA WING) BHOPAL			OBE CURRICULUM FOR THE COURSE			FORMAT- 3	Sheet No. 1/3
Branch	Civil Engineering/Construction Tech.& Management				Semester	3rd	
Course Code	303	Paper Code	6902	Course Name	Building Materials and Construction		
Course Outcome 1			Describe important building materials used in Construction and their uses.			Teach Hrs	Marks
Learning Outcome 1			Explain properties, types and uses of stones, aggregates, bricks and tiles.			10	12
Contents			<p>Introduction of Building materials and construction for Civil Engineer</p> <p>Stones : Classification of rocks, Important Definitions: Dressing, Quarrying, Seasoning, requirement of good building stone, Characteristics of important building stones and their uses - Basalt, Limestone (Kota Stone), Sandstone, Marble, Granite, Slate, Quartzite, Gneiss, Laterite</p> <p>Aggregates : Classification of Aggregate ,Properties and Uses of fine Aggregate, Tests on fine aggregate (Sand)</p> <p>Bricks : Classification of bricks, Frog of brick, Properties of Good Brick, Different field and laboratory test on brick as per BIS: 3495; Standard bricks; Special bricks- refractory bricks, hollow blocks, fly ash bricks, paver blocks</p> <p>Tiles - Characteristics of good tiles , Classification of tiles, Important tiles and their uses: Mosaic , Terracotta, Ceramic, Vitreous</p>				
Method of Assessment			External: End Semester Examination-Pen Paper Test				
Learning Outcome 2			Perform test on bricks and fine aggregates.			10	
Contents			<ol style="list-style-type: none"> 1. Determination of bulking of sand 2. Determination of fineness modulus by sieve analysis of fine aggregate. 3. Determination of water absorption test of bricks 4. Determination of compressive strength of bricks 5. Determination of efflorescence of bricks 				
Method of Assessment			Practical Exam : Both Internal and External				
Learning Outcome 3			Describe the properties of Murrum ,Lime, Cement, Mortar and basics of Concrete and carry out tests on cement.			08	10

Contents	<p>Murrum:- Properties of Murrum for Road work</p> <p>Lime: Classification, Slaking and hydraulicity, types of limes and their uses</p> <p>Cement : Chemical composition of cement ,Various types of cement and their uses - Ordinary portland cement, rapid hardening cement, low heat cement, portland pozzolana cement, sulphate resisting cement, white and colored cement, high alumina cement, aerated cement, storage of cement, tests on cement</p> <p>Mortar : Definition, functions of mortar and types of mortar - Lime mortar, Surkhi mortar, cement mortar, gauged mortar, gypsum mortar, Special mortars (fire resistant mortar, Damp proofing mortar), Grout</p> <p>Concrete : Introduction to concrete - Definition, properties</p> <p>Admixtures : Types of Admixture and their functions</p>		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Learning Outcome 4	Perform test on cement.	06	
Contents	<ol style="list-style-type: none"> 1. Determination of Standard Consistency 2. Determination of Initial and Final Setting Time 3. Determination of compressive strength of Cement. 		
Method of Assessment	Practical Exam : Both Internal and External		
Course Outcome 2	Describe timber, paints and other miscellaneous building materials used in construction.	Teach Hrs	Marks
Learning Outcome 1	Describe timber and wood products and its uses in building construction.	05	06
Contents	<p>Timber : Classification of trees, Characteristics of good timber, defects in timber, Preservation in timber -AsCu treatment, Chemical Salts, Oil Paints, Creosote treatment, Coal tar, Solignum paint</p> <p>Wood Products : Veneer, plywood, particle board, laminates, MDF, fiber board, block board their properties and uses</p>		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Learning Outcome 2	Discuss the composition and uses of protective paints and prescribe for a given condition.	05	05
Contents	<p>Composition of Paints, Characteristics of Good Paint</p> <p>Types and uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion</p>		
Method of Assessment	Internal -Pen Paper Test – Mid Semester Exam-I		
Learning Outcome 3	Explain various types of other building materials used and their uses in construction.	06	07

Contents	Use and brief introduction of Ferrous metals (cast iron, mild steel, HYSD Steel), Plastic, Gypsum, Glass, Asbestos, Aluminium , Tar, Asphalt, Bitumen , PVC, CPVC, PPF, Bonding agents, Epoxy resins, Waterproofing, Termite proofing and wall cladding materials		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Course Outcome 3	Explain different types of structures and foundations.	Teach Hrs	Marks
Learning Outcome 1	Classify various types of structures and list out components of building and their functions.	04	05
Contents	Types of buildings based on occupancy, loads on structure, types of structures – load bearing structures, Framed structures Building components and their function. Substructure – foundation, plinth, DPC. Superstructure – walls, sill, lintel & arches, doors & windows, floor, roof, parapet, beams, columns, staircase, surface finishes		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Learning Outcome 2	Explain layout procedure of small buildings and important points of supervision of earthwork and excavation.	04	05
Contents	Job layout : necessity and procedures, site clearance, preparing job lay out, layout for load bearing structure and framed structure by centerline And face line method, precautions while marking layout on ground. Earthwork: excavation for foundation, timbering and strutting, earthwork for embankment, material for plinth filling. Tools and plants used for excavation and earthwork		
Method of Assessment	Internal -Pen Paper Test – Mid Semester Exam-I		
Learning Outcome 3	Perform layout of small buildings.	06	
Contents	<ol style="list-style-type: none"> 1. Prepare foundation plan and marking on ground layout of load bearing structure by centre line method from the given plan of the building. 2. Prepare foundation plan and marking on ground layout of framed structure by centre line method from the given plan of the building. 3. Layout of two room building by face line method. 		
Method of Assessment	Practical Exam : Both Internal and External		
Learning Outcome 4	Classify the foundations and select appropriate one based on soil conditions.	05	06
Contents	Foundation and its purpose , Types of foundations – shallow and deep Shallow foundation : Isolated Footing, Spread Footing ,Strip Footing, Raft foundation, combined footing, grillage foundation and their Constructional details		

	Introduction to deep foundation : Pile and Well Foundation and their types Damp Proof Course : Source and effects of Dampness, Purpose, methods, materials used		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Course Outcome 4	Classify masonry works, doors, windows, stairs, floors and roofs.	Teach Hrs	Marks
Learning Outcome 1	Describe types of masonry work and related procedures.	08	10
Contents	<p>Stone masonry: Terminologies in stone masonry. Classification of stone masonry, Rubble masonry- Uncoursed and coursed rubble masonry, point to be observed in construction of stone masonry</p> <p>Brick masonry: Terminologies in brick masonry, types of Bonds: English, Flemish, stretcher and header bonds. Brick laying procedure, precautions in brick masonry, tools used in brick masonry</p> <p>Scaffolding : Purpose and its types</p> <p>Shoring and Underpinning : Purpose</p>		
Method of Assessment	Internal -Pen Paper Test – Mid Semester Exam-II		
Learning Outcome 2	Explain types of doors, windows and stairs.	10	12
Contents	<p>Doors : Terminologies of Doors, Brief description of different types of doors - Panelled Doors, Batten Doors, Flush Door, Collapsible Doors, Rolling Shutter, Revolving Doors, Glazed Doors</p> <p>Windows :Terminology of Windows, Brief description of different types of windows - Casement, Glazed, Sliding Windows , Louvered Window, pivoted, ventilators</p> <p>Stair case: Terminologies - landing, stringer, newel, baluster, rise, tread, width of stair case, hand rail, nosing, head room, flight, pitch. Various types of stair case – straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), spiral stair, tread riser stair</p>		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
Learning Outcome 3	Describe types of floors and roofs.	05	06
Contents	<p>Floors: Glossary of terms ,Types of floor finishes –concrete flooring, tile flooring, timber flooring , marble and kota flooring</p> <p>Roofs: Glossary of terms, Types of roofs, concept and function of flat and pitched roofs</p>		

Method of Assessment	External: End Semester Examination-Pen Paper Test		
Course Outcome 5	Explain the procedure of surface finishes and concept of green building.	Teach Hrs	Marks
Learning Outcome 1	Recognize surface finishes i.e. plastering, pointing and painting and select the appropriate techniques of finishes.	08	10
Contents	<p>Plastering : purpose – Types of plastering, Types of plaster finishes – Grit finish, rough cast, smooth cast, sand faced, pebble dash, acoustic plastering and plain plaster etc., Proportion of mortars used for different plasters Preparation of mortars, techniques of plastering and curing</p> <p>Pointing : purpose ,Types of pointing , methods of pointing</p> <p>Painting : objectives – method of painting new and old wall surfaces, wood surface and metal surfaces – powder coating and spray painting on metal surfaces</p> <p>White washing ,Color washing , Distempering, internal and external walls</p>		
Method of Assessment	Internal - Assignment/Seminar/Presentation		
Learning Outcome 2	Recognise the purpose of energy efficient buildings and rain water harvesting system in buildings.	05	06
Contents	Green Building: Concept, Purpose, Components, Energy Efficiency and Basics of rain water harvesting.		
Method of Assessment	External: End Semester Examination-Pen Paper Test		
	Total	105	100

Note: 1. Internal marks of practical exam is mentioned in Format 4.

2. External practical exam will be of maximum 30 marks and any of the practical mentioned in LO's can be assessed.

The following suggested exercises could be performed in 8 hrs out of 83 theory hours.

LIST OF SUGGESTED EXERCISES OF BUILDING MATERIALS AND CONSTRUCTION	
1	Identification of stones by visual examination: Basalt, Limestone (Kota Stone), Sandstone, Marble, Granite, Quartzite, Gneiss, Laterite.
2	Determination of dimension, Colour, Structure, Soundness Test and Dropping Test of bricks.

3	Various Field Test (Colour Test, Lump Test etc.) of cement.
4	Demonstration of tools and Plants used in building construction.
5	Check and transfer line and level of plinth, sill, lintel, flooring, slab level of a building and writing report of the process.