CEM202N - Building Materials

Teaching Scheme: 2L **Total Credit: 2**
Evaluation Scheme: 30MSE + 10ISA + 60ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION

This course provides an over-view of the basics of building materials used for construction of building. Besides this, students also learn about construction of brick masonry, its requirements and methods of construction. Students will also learn different components of building.
Course Objectives
1. To make students to understand basic building materials used for construction of buildings.
2. To make students to understand different types of structures and components of buildings.

COURSE OUTCOMES

After successful completion of this course; student shall be able to
1. Identify relevant type of construction materials for the given type of building.
2. Use the relevant type of special purpose construction materials in the given situation.
3. Undertake the given type of building construction activity for the given component of building structure.
4. Design the relevant means of communication for the given building structure.

Relevance of Program Outcomes (Pos) and strength of co-relation

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	2	3									2		
2	1	3	1	2								1	3	2	
3	2	2	2	3								1	1	2	
4		2	2	2									2		
5	2	2	3	2								1	2	2	

1-Weakly correlated – 2 Moderately correlated – 3 Strongly correlated

COURSE CONTENT

Building [04 Hrs.]

Definition and Function of building, Construction material- Scope of construction materials in various civil engineering sectors. Sources of materials, Natural, Artificial- special, finishing and recycled.

Classification of materials-[03 Hrs.]

Natural Building construction Materials – Stone, Timber, Soil, Sand and Coarse Aggregates, Bitumen: Types and uses.

Artificial Building Construction Materials[02 Hrs.]

– Cement, Clay Brick, Flooring Tiles, Concrete Blocks, Plywood, particle board, Veneers, laminated board and Glass: Types and uses.

Special Building Construction Materials[02 Hrs.]

– Waterproofing, Termite proofing, and Thermal and sound insulating: Types and suitability.

Fibers

Jute, Glass, and Plastic Asbestos Fibers: Types and uses

Geopolymer cement [02Hrs.]

- Geo-cement: properties and applications.

Construction of Building [06 Hrs.]

- Components of building and their function, substructure and superstructure,

Formwork- [03 Hrs.]

Definition, Requirements, Materials used, Types of Formwork.

Foundation- [02Hrs.]

Functions, Types: Shallow Foundation and Deep Foundation.

Stone Masonry[03 Hrs.]

Terms used in stone masonry- facing, backing, hearting, through stone, corner stone, cornice.

Type of stone masonry: Rubble masonry, Ashlar Masonry and their types.

Brick masonry[03 Hrs.]

Terms used in brick masonry- header, stretcher, closer, quoins, course, face, back, hearting, bat bond, joints, lap, frog, line, level and plumb. Bonds in brick masonry header bond, stretcher bond, English bond and Flemish bond. Precautions to be observed in Brick Masonry Construction.

Text Books

1. Building Construction, S.P. Arora and S.P. Bindra, Dhanpat Rai Publications, 5th edition 2013
2. Ghose D. N Construction Materials Tata McGraw Hill, New Delhi, 2014 ISBN: 9780074516478
3. Building Construction, Sushil Kumar, Standard Publishers Distributors, 16th edition 2006

Reference books

1. Building Construction, Ashok K. Jain, B. C. Punmia, Arun Kr. Jain, Laxmi Publications, 11th edition 2015.
2. Rangwala, S.C., Engineering Materials, Character publisher, Ahemdabad, 2015, ISBN: 9789385039171
3. S. C. Rangawala Building Construction, Charotar Publication,Dist-Anand ISBN-10: 8185594856 ISBN-13: 978-8185594859

CEM255N ENVIRONMENTAL ENGINEERING

Teaching Scheme: 2LTotal:02 **Credit:** 02
Evaluation Scheme: 30 MSE + 10 ISA + 60 ESE **Total Marks:** 100
Duration of ESE: 03Hrs

COURSE DESCRIPTION

This course introduces about source of water, water quality and quantity, suitable methodsfor treatment of the impurities in water design of water treatment plant and water supply system.

COURSE OUTCOMES

After successful completion of this course; student shall be able to

1. understand the water supply scheme
2. estimate quantities and quality of water for municipal purpose.
3. analyze water supply engineering problems.
4. design and operate the processes used in water treatment systems.

Relevance of Program Outcomes (Pos)and strength of co-relation

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3												2		
2	2		2										3		
3		3	1											2	
4	2	2											3		

1-Weakly correlated 2 – Moderately correlated 3 – Strongly correlated

COURSE CONTENT

Water Demand and Quantity studies: Estimation of water demand for a town or city, Types of water demands, Per capita Demand, Factors affecting the Per Capita Demand, Variations in the Demand, Design Period, Factors affecting the Design period, Population Studies, Population Forecasting Studies. Collection of Water: Factors governing the selection of the intake structure, Types of Intakes.

Conveyance of Water: Gravity and Pressure conduits, Types of Pipes, Pipe Materials, Pipe joints, Design aspects of pipelines, laying of pipe lines.

Quality and Analysis of Water: Characteristics of water – Physical, Chemical and Biological. Analysis of Water – Physical, Chemical and Biological. Impurities in water, Water borne diseases. Drinking water quality standards.

Treatment of Water: Flowchart of water treatment plant, Treatment methods (Theory and Design) - Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration, Chlorination and other Disinfection methods, Softening of Water, De-fluoridation, Removal of Odours.

Distribution of Water: Methods of Distribution system, Components of Distribution system, Layouts of Distribution networks, Pressures in the distribution layouts, Analysis of Distribution networks, Water connection to the houses.

Text Book

1. Water Supply Engineering, Garg S.K , Khanna Publisher, New Delhi 33rd edition 2015.

2. Water Supply and Sanitation Engineering, G.S.Birdi and J.S.Birdi, Dhanpat Rai Publication Company, New Delhi 9th edition 2014.

Reference Book

1. Water Supply and Sewerage, E W Steel and Terence J McGhee, Tata McGraw Hill Publishing Company, 6th edition 2007
2. Physici-Chemical Processes for Water Quality Control,Walter J Weber, Wiley Inter-science Publications 2012.
3. Water Supply Engineering, Punamia, Jain and Jain, Laxmi Publications, New Delhi 2015.
4. Manual on Water Supply and Treatment, Central Public Health and Environmental Engineering, Organization, Ministry of Urban Affairs, Government of India.
5. Water Supply, Waste Disposal and Environmental Engineering, A. K. Chatterjee, Khanna Publisher, 8th edition, 2006