



Building Materials & Construction

SWAYAM Prabha Course Code - C14

PROFESSOR'S NAME	Prof. B. Bhattacharjee
DEPARTMENT	Civil Department
INSTITUTE	Indian Institute of Technology, Delhi
Course Outline	<p>Functions of buildings and structure in general. Loads on buildings as per IS 875, IS 1893 and NBC. Functional requirements of buildings and necessity of byelaws.</p> <p>Role of materials in construction</p> <p>Concrete as a material, its ingredients and Concrete Production Process including prefabrication, modular coordination</p> <p>Cement: Hydration of cement, Chemical reaction, Structure of cement paste, Consistency and setting. Lime and supplementary cementations materials.</p> <p>Fresh Concrete: Role of aggregates and water in fresh concrete, workability Test for workability Role of admixtures, Segregation and bleeding. Strength of concrete: Role of porosity, w/c ratio, Role of aggregate, aggregate –mortar interface, Tensile strength, Modulus of elasticity and their tests. NDT</p> <p>Durability and long term performance of concrete, Role of mineral admixture, w/c ratio and cement content. Sulphate attack, corrosion of rebar etc, IS 456 requirements. Cement, aggregate and water selection for concrete</p> <p>Mix design of concrete</p> <p>Bricks and mortar and their properties, brick and other masonry construction, Selection of bricks/masonry units and mortar for masonry. Requirements of walls and types of walls. Masonry design requirements as per IS 1905</p> <p>Metals with reference to Structural Steel: Structure and its role in properties of steel. Strengthening mechanism in metals. Behaviour in service and corrosion. Uses of metals in civil engineering.</p> <p>Plastics and Polymers in construction, admixture paints, sealants and adhesives.</p>

	Water proofing materials Timber and plywood and glasses Typical roof construction and foundations, plastering pointing and damp proofing
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COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic
1	L1	Functions Of Buildings
2	L2	Role Of Material In Construction
3	L3	Concrete: Material
4	L4	Concrete Production Contd..
5	L5	Concrete Production Contd.
6	L6	Concrete: Production Pumping, Placing
7	L7	Concrete: Production Curing
8	L8	Cement: Hydration
9	L9	Cement and Cementitious Material
10	L10	Fresh Concrete
11	L11	Fresh Concrete: Role of Mix Parameters
12	L12	Fresh Concrete : Role of Admixtures
13	L13	Fresh Concrete : Segregation Bleeding
14	L14	Strength of Concrete I
15	L15	Strength of Concrete II
16	L16	Strength of Concrete III
17	L17	Mechanical Properties of Concrete I

18	L18	Mechanical Properties of Concrete II
19	L19	Strength of Concrete : Non Destructive
20	L20	Durability of Concrete I
21	L21	Durability of Concrete II
22	L22	Durability of Concrete III
23	L23	Cement Aggregate and Water Selection
24	L24	Mix Design of Concrete
25	L25	Mix Design Of concrete IS Method
26	L26	Mix Design Of Concrete: British
27	L27	Masonry : Materials
28	L28	Masonry : Walls
29	L29	Masonry : Walls; Resistance I
30	L30	Masonry : Walls; Resistance
31	L31	Walls : Functional Performances
32	L32	Walls : Defects and Durability
33	L33	Metals Fundamentals
34	L34	Metals and Iron Systems
35	L35	Steel: Uses in Construction
36	L36	Steel : Uses in Rebar
37	L37	Polymer in Construction
38	L38	Polymer in Construction : Uses
39	L39	Glass and Timber : Glass
40	L40	Glass and Timber: Timber

41	L41	Roof and Floor Construction
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References if Any: