

Discipline: Civil Engg.	Semester: 3rd	Name of the Teaching Faculty: BIDHU BHUSAN SABAR
Subject: Building Construction	No. of Days/Per week class allotted: 03	Semester From Date: 14.07.2025 To Date: 15.11.2025
		No. of Weeks: 18 Weeks
week	Class Days	TOPIC TO BE COVERED
1st week	1st	Definition of centre of gravity - Centre of gravity of Symmetrical shapes
	2nd	solid / hollow square, rectangular, circular, I Sections)
	3rd	Moment of inertia (M.I.): Definition,
2nd	1st	M.I. of plane lamina, Radius of gyration, section modulus, Parallel and Perpendicular axes theorems (without derivations),
	2nd	M.I. of rectangle, square, circle, semicircle
3rd	1st	M.I. of symmetrical and unsymmetrical I-section, Channel section,
	2nd	T-section, Angle section, Hollow sections
	3rd	built up sections about centroidal axes and any other reference axis. Polar Moment of Inertia of solid circular sections.
4th	1st	Definition of rigid, elastic and plastic bodies, deformation of elastic body under various forces,
	2nd	Definition of stress, strain, elasticity, Hook's law, Elastic limit, Modulus of elasticity.
5th	2nd	Type of Stresses - Normal, Direct, Bending and Shear and nature of stresses i.e. Tensile and Compressive stresses.
	3rd	Standard stress strain curve for tor steel bar under tension, Yield stress, Proof stress, Ultimate stress
	1st	Strain at various critical points, Percentage elongation and Factor of safety.
6th	1st	Deformation of body due to axial force, forces applied at intermediate sections
	2nd	Maximum and minimum stress induced, Composite section under axial loading.
7th	2nd	Concept of temperature stresses and strain, Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section)
	3rd	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio
8th	1st	Biaxial and tri-axial stresses, volumetric strain, change in volume, Bulk modulus (Introduction only). Relation between modulus of elasticity, modulus of rigidity and bulk modulus (without derivation).
	2nd	Principal stresses and strains: Occurrence of normal and tangential stresses - Concept of Principal stress and Principal Planes - major and minor principal stresses and their orientations
	3rd	stresses on a given plane - shear and normal stress components on any inclined plane - Mohr's circle and its use in solving problems on complex stresses - Numerical problems
9th	1st	Types of supports, beams and loads.
	2nd	Concept and definition of shear force and bending moment
	3rd	Relation between load, shear force and bending moment (without derivation)
10th	1st	Shear force and bending moment diagram for cantilever subjected to point loads.
	2nd	Shear force and bending moment diagram for cantilever subjected to UDL & couple. (combination of any two types of loading),
	3rd	Shear force and bending moment diagram for simply supported beam subjected to point loads.
11th	1st	Shear force and bending moment diagram for simply supported beam subjected to UDL & couple. (combination of any two types of loading),
	2nd	point of contra flexure.

12th	3rd	Concept and theory of pure bending, assumptions, flexural equation (without derivation)
13th	1st	bending stresses and their nature, bending stress distribution diagram
	2nd	Concept of moment of resistance
14th	3rd	and simple numerical problems using flexural equation.
	1st	Shear stress equation (without derivation). relation between maximum and average shear stress for rectangular and
	2nd	circular section, shear stress distribution diagram.
15th	1st	Shear stress distribution for square, rectangular,
	2nd	circle, hollow, square, rectangular, circular, angle sections,
16th	3rd	channel section, I-section, T section. Simple numerical problems based on shear equation.
	1st	Concept of compression member, short and long column, Effective length, Radius of gy- ration,
	2nd	Slenderness ratio, Types of end condition for columns, Buckling of axially loaded columns.
17th	1st	Euler's theory, assumptions made in Euler's theory and its limitations
	2nd	Application of Euler's equation to calculate buckling load.
18th	3rd	Rankine's formula and its application to calculate crippling load.
	1st	Concept of working load/safe load, design load and factor of safety.

Signature of Faculty:

[Signature]
05/08/25

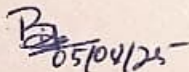
Signature of HOD

[Signature]
05/08/25

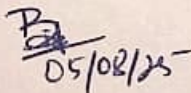
Discipline: Civil Engg.	Semester: 3rd	Name of the Teaching Faculty: BIDHU BHUSAN SABAR
Subject: Building Construction	No. of Days/Per week class allotted: 03	Semester From Date: 14.07.2025 To Date: 15.11.2025
		No. of Weeks: 18 Weeks
WEEK	Class Days	TOPIC TO BE COVERED
1ST	1st	Overview of Building Components 4(p) Classification of Buildings as per National Building Code Group A to I,
	2nd	as per Types of Constructions- Load Bearing Structure, Framed Structure, Composite Structure.
	3rd	Building Components – Functions of Building Components, substructure – Foundation, Plinth.
2ND	1st	Superstructure – Walls, Partition wall, Cavity wall, Sill, Lintel, Doors and Windows, Floor, Mezzanine floor, Roof, Columns, Beams, Parapet.
	2nd	Construction of Substructure 8(p) Job Layout: Site Clearance, Layout for Load Bearing Structure and Framed Structure by Center Line and Face Line Method, Precautions.
	3rd	Earthwork: Excavation for Foundation, Timbering and Strutting, Earthwork for embankment
3RD	1st	Material for plinth Filling, Tools and plants used for earthwork.
	2nd	Foundation: Functions of foundation,
	3rd	Types of foundation – Shallow Foundation, Stepped Footing, Wall Footing, Column Footing,
4TH	1st	Isolated and Combined Column Footing, Raft Foundation, Grillage Foundation.
	2nd	Deep Foundation – Pile Foundation, Well foundation and Caissons,
	3rd	Pumping Methods of Dewatering, Deep wells, Well points, Cofferdams (Introduction only).
5TH	1st	Construction of Superstructure 12(p) Stone Masonry: Terms used in stone masonry- facing, backing, hearting, through stone, corner stone, cornice.
	2nd	Types of stone masonry: Rubble masonry, Ashlar Masonry and their types.
6TH	1st	Joints in stone masonry and their purpose.
	2nd	Selection of Stone Masonry, Precautions to be taken in Stone Masonry Construction.
	3rd	Brick masonry: Terms used in brick masonry- header, stretcher, closer, quoins, course, face, back, hearting, bat bond, joints, lap, frog line, level and plumb.
7TH	1st	Bonds in brick masonry- header bond, stretcher bond, English bond and Flemish bond.
	2nd	Requirements of good brick masonry. Junctions in brick masonry and their purpose and procedure.
8TH	1st	Precautions to be observed in Brick Masonry Construction. Comparison between stone and Brick Masonry.
	2nd	Tools and plants required for construction of stone and brick masonry. Hollow concrete block masonry and composite masonry.
9TH	1st	Scaffolding and Shoring: Purpose, Types of Scaffolding, Process of Erection and Dismantling.
	2nd	Purpose and Types of Shoring, Underpinning. Formwork: Definition of Formwork
	3rd	Requirements of Formwork, Materials used in Formwork, Types of Formwork, Removal of formwork.
10TH	1st	Building Communication and Ventilation 8(p) Horizontal Communication: Doors –Components of Doors, Full Paneled Doors,
	2nd	Partly Paneled and Glazed Doors, Flush Doors, Collapsible Doors, Rolling Shutters, Revolving Doors, Glazed Doors. Sizes of Door recommended by BIS.
	3rd	Windows: Component of windows, Types of Windows – Full Paneled, Partly Paneled and Glazed, wooden, Steel, Aluminum windows
11TH	1st	Sliding Windows, Louvered Window, Bay window, Corner window, clear storey window, Gable and Dormer window, Skylight. Sizes of Windows recommended by BIS. Ventilators.
	2nd	Fixtures and fastenings for doors and windows. Material used and functions of Window Sill and Lintels, Shed / Chajja.
	3rd	Vertical Communication: Means of Vertical Communication- Stair Case, Ramps, Lift, Elevators and Escalators.

12TH	1st	Terms used in staircase steps, tread, riser, nosing, soffit, waist slab, baluster, balustrade, scotia, hand rails, newel post, landing, headroom, winder
13TH	1st	Types of staircase (On the basis of shape): Straight, dog-legged, open well, Spiral, quarter turn, bifurcated, Three quarter turn and Half turn, (On the basis of Material): Stone, Brick, R.C.C., wooden and Metal.
	2nd	Building Finishes 13(p) Floors and Roofs: Types of Floor Finishes and its suitability- Kota, Marble, Granite, Ceramic Tiles,
14TH	1st	Vitrified, Chequered Tiles, Paver Blocks, Concrete Floors, wooden Flooring, Skirting and Dado.
	2nd	Process of Laying and Construction, Finishing and Polishing of Floors,
	3rd	Roofing Materials- RCC, Mangalore Tiles, AC Sheets, G.I. sheets, Corrugated G.I. Sheets,
15TH	1st	Plastic and Fibre Sheets. Types of Roof: Flat roof, Pitched Roof- King Post truss,
	2nd	Queen Post Truss, terms used in roofs.
16TH	1st	Wall Finishes: Plastering – Necessity of Plastering, Procedure of Plastering.
	2nd	Single Coat Plaster, Double Coat Plaster, Rough finish, Neeru Finishing and Plaster of Paris (POP).
	3rd	Special Plasters- Stucco plaster, sponge finish, pebble finish.
17TH	1st	Plaster Board and Wall Claddings. Precautions to be taken in plastering.
	2nd	defects in plastering. Painting – Necessity,
	3rd	Types of painting and procedure of Painting. Painting –Necessity,
18TH	1st	Surface Preparation for painting, Methods of Application.
	2nd	Revision
	3rd	Revision

Signature of Faculty:


05/04/25

Signature of HOD


05/08/25

Discipline: Civil Engg.	Semester: 5TH	Name of the Teaching Faculty: BIDHU BHUSAN SABAR
Subject: Structural Design-II	No. of Days/Per week class allotted: 04	Semester From Date: 14.07.2025 To Date: 15.11.2025
		No. of Weeks: 18 Weeks
Week(15)	CLASS DAYS	TOPIC TO BE COVERED
1ST	1st	Common steel structures, Advantages & disadvantages of steel structures
	2nd	Types of steel, properties of structural steel
	3rd	Rolled steel sections, special considerations in steel design.
2ND	1st	Loads and load combinations.
	2nd	Structural analysis and design philosophy. Brief review of Principles of Limit State design.
3RD	1st	Bolted Connections Classification of bolts, advantages and disadvantages of bolted connection
	2nd	Different terminology, spacing and edge distance of bolt holes
	3rd	Types of bolted connections.
4TH	1st	Types of action of fasteners, assumptions and principles of design.
	2nd	Strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity), reduction factors, and shear capacity of HSFG bolts
5TH	1st	Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)
	2nd	Efficiency of a joint. Welded Connections:
	3rd	Advantages and Disadvantages of welded connection
6TH	1st	Types of welded joints and specifications for welding
	2nd	Design stresses in welds. Strength of welded joints.
7TH	1st	Common shapes of tension members
	2nd	Maximum values of effective slenderness ratio
	3rd	Analysis of tension members. (Considering strength only and concept of block shear failure.)
8TH	1st	Design of tension member
	2nd	Design of tension member
	3rd	Common shapes of compression member
9TH	1st	Buckling class of cross sections
	2nd	slenderness ratio
10TH	1st	Design compressive stress
	2nd	strength of compression members
	3rd	Analysis and Design of compression members (axial load only).
11TH	1st	Common cross sections and their classification
	2nd	Deflection limits, web buckling and web crippling.
11th	1st	Design of laterally supported beams against bending and shear.
12th	1st	Round Tubular Sections, Permissible Stresses
13TH	1st	Tubular Compression & Tension Members
14TH	1st	Joints in Tubular trusses
	2nd	Design considerations for Masonry walls & Columns
	3rd	Load Bearing & Non-Load Bearing walls
15th	1st	Permissible stresses, Slenderness Ratio
16th	1st	Effective Length, Height & Thickness.
17th		Revision
18th		Revision

Signature of Faculty:

Signature of HOD