

Department of Civil Engineering and Applied Mechanics
Lesson Plan B. Tech IIyear
CE-21502/21512 CONSTRUCTION TECHNOLOGY –I
Semester: IV

S.No.	Topic covered (Theory)	Session 2024-25
		LECTURE NO
1	Stone Masonry: Terms used and definitions, Type of Stone Masonry.	Lecture No 01
2	Plant & Equipment Used, Defects in Stones.	Lecture No 02
3	Stone Masonry Details at Doors Window opening Cornices.	Lecture No 03
4	Brick Masonry: Characteristics and Classification of Bricks Laying.	Lecture No 04
5	Bonds in Bricks Masonry.	Lecture No 05
6	Construction details of composite wall, Cavity wall.	Lecture No 06
7	Hollow Block Construction, reinforced Brick work.	Lecture No 07
8	Cast in Situ RCC Construction: Cost in Situ RCC Construction, Form Work for Various Structural Components.	Lecture No 08
9	Mixing and Placing Concrete, Reinforcement and its Placing.	Lecture No 09
10	Formwork and its design principles.	Lecture No 10
11	Precast & Prestressed Construction: Introduction to precast & prestressed construction, Joints in precast construction.	Lecture No 11
12	Steel Construction: Method of Structural Connections, Bolting, Riveting, Welding.	Lecture No 12
13	Fabrication, Erection of Various Structural Components including girders and trusses.	Lecture No 13
14	Construction of Structure: Load Bearing, Framed and composite Construction.	Lecture No 14
15	Different types of foundations, Bridging Elements.	Lecture No 15
16	Arches and Lintels.	Lecture No 16
17	Various Types of Retaining walls, Prefabricated Construction.	Lecture No 17
18	Timber Construction: Method of Structural connections.	Lecture No 18
19	Fastenings used in timber construction.	Lecture No 19
20	Prefabricated Construction.	Lecture No 20
21	Floors: Introduction, Factor affecting selection of floor, types of flooring, Varieties of floor finishes.	Lecture No 21
22	Types of ground floors and Method of construction.	Lecture No 22
23	Types of ground floors and basement and Method of construction of floors.	Lecture No 23
24	Types of Storey(upper) floors.	Lecture No 24
25	Method of construction of Storey floors.	Lecture No 25

26	Roof: Introduction, Classification of roofs, Definitions and terms.	Lecture No 26
27	Pitched roof and types of Pitched Roofs.	Lecture No 27
28	Flat roof, types and method of construction.	Lecture No 28
29	Water Proofing of flat roofs and drainage of flat and pitched roof.	Lecture No 29
30	Structure of Roof, Types of Coverings and Ceilings.	Lecture No 30
31	Stairs: Types, Layout and Construction of stair cases, Definitions and terms.	Lecture No 31
32	Ramps, Ladders, Lifts, Escalators, Doors, Windows, Ventilators – Their Types.	Lecture No 32
33	Construction Equipments: Introduction, Mechanization in Construction, need for mechanization in construction, classification.	Lecture No 33
34	Concrete Construction Equipment, Aggregate preparation Equipment.(Types, Output Efficiency, Size, Application, Operation.)	Lecture No 34
35	Earthmoving equipment: Excavating equipment and Earth moving and excavating equipments.(Types, Output Efficiency, Size, Application, Operation) Dewatering equipment.	Lecture No 35
36	Damp-Proofing: Introduction, Causes of dampness, effect of dampness and remedial measures and treatment.	Lecture No 36
37	Plastering, Object of plastering, selection of type of plaster, Preparation of surface for plastering, methods of plastering ,defects in plastering and remedial measures.	Lecture No 37
38	Pointing, method of pointing, types of pointing. Painting: Introduction, objects of painting, characteristics of an ideal paint and types.	Lecture No 38
39	White washing, Preparation of surface for white washing, Colour washing.	Lecture No 39
40	Distempering, composition, process of distempering and properties of distempering.	Lecture No 40

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Department of Civil Engineering And Applied Mechanics
Lesson Plan B. Tech II year
CE21504: TRANSPORTATION ENGINEERING
Semester: IV

Lecture No.	Topic	Subtopics	Session 2024-25	
			LECTURE NO	
1	Classification of Roads	Functional, administrative, pavement-based	Lecture No 01	
2	Road Patterns & History	Patterns, historical development in India	Lecture No 02	
3	Road Development Plans	Nagpur, Bombay, Lucknow plans	Lecture No 03	
4	Present Road Status & Alignment Design	NH, SH, controlling factors in alignment	Lecture No 04	
5	Aerial Photography & Remote Sensing	Applications in highway planning	Lecture No 05	
6	Highway Surveys	Reconnaissance, preliminary, detailed	Lecture No 06	
7	Cross Sections	Urban/rural sections, ROW	Lecture No 07	
8	Elements of Cross Sections	Shoulders, medians, camber	Lecture No 08	
9	Sight Distances	SSD, OSD, ISD	Lecture No 09	
10	Super Elevation & Extra Widening	Need, design approach	Lecture No 10	
11	Transition Curves	Length determination, types	Lecture No 11	
12	Vertical Alignment	Summit and valley curves	Lecture No 12	
13	Horizontal-Vertical Combinations	Design coordination	Lecture No 13	
14	Traffic Introduction	Road user & vehicle characteristics	Lecture No 14	
15	Traffic Studies I	Speed, volume, O-D	Lecture No 15	
16	Traffic Studies II	Parking, accident, capacity	Lecture No 16	
17	Traffic Signs & Markings	Types and placement	Lecture No 17	
18	Traffic Signals & Management	Signal types, warrants, controls	Lecture No 18	
19	Intersections & Street Lighting	At-grade, rotary, lighting needs	Lecture No 19	
20	Railways & Gauges	Development, types	Lecture No 20	
21	Rails, Sleepers & Ballast	Functions, materials	Lecture No 21	
22	Fastenings & Coning	Cross section, wear	Lecture No 22	
23	Track Geometry	Gradient, cant, transitions	Lecture No 23	
24	Points & Crossings	Turnouts, junction design	Lecture No 24	
25	Signalling & Interlocking	Train control, types	Lecture No 25	

26	Station Yards & Review	Types, functions	Lecture No 26	
27	Ship Characteristics & Ocean Forces	Winds, waves, tides	Lecture No 27	
28	Harbour Planning	Site selection, layout	Lecture No 28	
29	Coastal Protective Works	Breakwaters, groins, revetments	Lecture No 29	
30	Port Facilities & Layout	Design considerations	Lecture No 30	
31	Pier, Wharf & Fender Systems	Structural features	Lecture No 31	
32	Review and Summary	Final wrap-up	Lecture No 32	

Department of Civil Engineering And Applied Mechanics
Lesson Plan B. Tech II year
CE 21518- ENGINEERING GEOLOGY
Semester: IV

SNO.	Topic covered (Theory)	Session 2024-25
		LECTURE NO
1	Introduction , disciplines and scope of engineering geology	Lecture No 01
2	Importance of geology in civil engineering	Lecture No 02
3	Earth surface features and internal structure	Lecture No 03
4	Geomorphologic process and its classification	Lecture No 04
5	Weathering of rocks, geological action of running water wind and underground water	Lecture No 05
6	Mineralogy ,Rock cycle	Lecture No 06
7	Classification of igneous rocks	Lecture No 07
8	Strength aspect of igneous rocks	Lecture No 08
9	Classification of sedimentary rocks	Lecture No 09
10	Strength aspect of sedimentary rocks	Lecture No 10
11	Classification of metamorphic rocks	Lecture No 11
12	Strength aspects of metamorphic rocks	Lecture No 12
13	Suitability of igneous, metamorphic and sedimentary rocks as engineering materials	Lecture No 13
14	Relationship between physical and geomechanical properties of rock	Lecture No 14
15	Rock deformation, dip, strike, outcrops	Lecture No 15
16	Classification and field identification of folds and faults	Lecture No 16
17	Classification and field identification of joints, unconformity and their importance in civil engineering	Lecture No 17
18	Types, components and elements of remote sensing	Lecture No 18
19	EMS and MSS	Lecture No 19
20	Visual interpretation technique	Lecture No 20
21	Causes of landslides	Lecture No 21
22	Types of landslides	Lecture No 22
23	Classification of landslides	Lecture No 23
24	Preventive measures of landslides	Lecture No 24
25	Causes and effects of earthquake	Lecture No 25
26	Measurement of earthquake	Lecture No 26
27	Seismic zones of India	Lecture No 27
28	Geological consideration for construction of building and other projects in seismic areas	Lecture No 28
29	Geological investigations for dams and reservoirs	Lecture No 29
30	Tunneling in rocks & bridges, railways and highways	Lecture No 30
31	Tunneling in railways and highways	Lecture No 31
32	Classification of geophysical methods	Lecture No 32

33	Geophysical explorations for surface and subsurface structures	Lecture No 33
34	Scope of rock excavation	Lecture No 34
35	Geological maps	Lecture No 35
36	Study of geological models	Lecture No 36
37	Application of global positioning system(GPS) in civil engineering	Lecture No 37
38	Application of geographic information system(GIS) in civil engineering	Lecture No 38
39	Application of global positioning system(GPS) in resource mapping	Lecture No 39
40	Application of geographic information system(GIS) in resource mapping	Lecture No 40

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Department of Civil Engineering And Applied Mechanics
Lesson Plan B. Tech II year
CE 21514 STRUCTURAL MECHANICS
Semester: IV

SNO.	Topic covered (Theory)	Session 2024-25
		LECTURE NO
1	Resilience and Proof Resilience, Elastic Strain Energy in Materials subjected to Tension, Compression	Lecture No 01
2	Strain Energy in Materials subjected to Shear	Lecture No 02
3	Strain Energy in Materials subjected to Bending and Torsion	Lecture No 03
4	Theories of Elastic Failure	Lecture No 04
5	Gradually and suddenly applied Loads.	Lecture No 05
6	Impact and Falling Loads.	Lecture No 06
7	Strain Energy Method for Deflection of Beams	Lecture No 07
8	Strain Energy Method for Deflection of Determinate Trusses	Lecture No 08
9	Thin walled cylindrical pressure vessels under internal and external radial pressure.	Lecture No 09
10	Spherical pressure vessels under internal and external radial pressure.	Lecture No 10
11	Castigliano's First Theorem and its Application to find Deflections	Lecture No 11
12	Long and Short Columns, Axial and Eccentric Loads.	Lecture No 12
13	Euler's Theory	Lecture No 13
14	Rankine's Formula for Axially Loaded Columns	Lecture No 14
15	Eccentrically Loaded Columns, ISI-Formula for Columns	Lecture No 15
16	Introduction to Beam-Column behaviour and Column with Lateral Loads.	Lecture No 16
17	Principal Moment of Inertia	Lecture No 17
18	Unsymmetrical Bending of Standard Structural Section	Lecture No 18
19	Change in Orientation of Neutral axis-plane	Lecture No 19
20	Shear Centre.	Lecture No 20
21	Thin walled cylindrical pressure vessels under internal and external radial pressure.	Lecture No 21
22	Spherical pressure vessels under internal and external radial pressure.	Lecture No 22
23	Wire wound thin tubes	Lecture No 23
24	Circumferential Stresses in Curved Beam	Lecture No 24
25	Correction Factors for Straight Beams Formula	Lecture No 25
26	Radial Stresses in Curved Beams, Application to Closed Rings	Lecture No 26
27	Chain Links. Bending of Curved Bar out of its Plane of Initial Curvature	Lecture No 27
28	Application to Beams Curved in Plain	Lecture No 28
29	Closed coiled and open coiled helical springs	Lecture No 29
30	Stress in the spring materials	Lecture No 30
31	Stiffness of springs	Lecture No 31
32	Spring subjected to axial loads and couples	Lecture No 32

33	Grouping of springs. Leaf Spring	Lecture No 33
34	Semi Elliptic, Quarter Elliptic Spring.	Lecture No 34
35	Single degree of freedom system : Free & Forced vibration	Lecture No 35
36	Linear viscous damper, Coulomb Damper	Lecture No 36
37	Response Harmonic Excitation	Lecture No 37
38	Rotation Unbalance & support Excitation	Lecture No 38
39	Vibration isolation and Transmissibility.	Lecture No 39
40	Single Degree of freedom system as vibrometer accelerometer	Lecture No 40

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Department of Civil Engineering And Applied Mechanics
Lesson Plan B. Tech II year
CE 21517 Fluid Mechanics
Semester: IV

SNO.	Topic covered (Theory)	Session 2024-25
		LECTURE NO
1	Fluid Properties and Fluid Statics: Concept of fluid and flow	Lecture No 01
2	Ideal and real fluids, Continuum concept	Lecture No 02
3	Properties of fluids, Newtonian and non-Newtonian fluids	Lecture No 03
4	Pascal's law, Hydrostatic equation	Lecture No 04
5	Hydrostatic forces on plane surface	Lecture No 05
6	Hydrostatic forces on curved surface	Lecture No 06
7	Stability of floating and submerged bodies	Lecture No 07
8	Relative equilibrium	Lecture No 08
9	Exercise for Numerical	Lecture No 09
10	Fluid Kinematics : Eulerian and Lagrangian description of fluid flow	Lecture No 10
11	Stream, streak and path lines	Lecture No 11
12	Types of flows, flow rate and continuity equation	Lecture No 12
13	Differential equation of continuity in cylindrical and polar coordinates	Lecture No 13
14	Rotation, vorticity and circulation, stream function, Potential functions, flow net	Lecture No 14
15	Exercise for Numerical	Lecture No 15
16	Fluid Dynamics: Concept of system and control volume, Euler's equation	Lecture No 16
17	Fluid Properties and Fluid Statics: Concept of fluid and flow	Lecture No 17
18	Bernoulli's equation, venturimeter, orifice	Lecture No 18
19	Orificemeter, mouthpieces	Lecture No 19
20	Kinetic and momentum correction factors	Lecture No 20
21	Exercise for Numerical	Lecture No 21
22	Introduction to Units, Dimensions & Dimensional Homogeneity	Lecture No 22
23	Buckingham Pi-Theorem & Dimensionless Numbers	Lecture No 23
24	Similitude, Model Laws & Applications	Lecture No 24
25	Exercise for Numerical	Lecture No 25
26	Introduction to Pipe Flow – Laminar Flow & Flow Between Parallel Plates	Lecture No 26
27	Branched pipes; equivalent pipe, power transmission through pipes	Lecture No 27
28	Turbulent flow: Shear stress in turbulent flow	Lecture No 28
29	Prandtl mixing length hypothesis	Lecture No 29

30	Hydraulically smooth and rough pipes, velocity distribution in pipes	Lecture No 30
31	Pipe Network Analysis – Hardy Cross Method	Lecture No 31
32	Exercise for Numerical	Lecture No 32
33	Introduction to open channel flow	Lecture No 33
34	Uniform Flow , Normal Depth , Chezy's Equation	Lecture No 34
35	Manning Formula, Most efficient Hydraulic Section	Lecture No 35
36	Gradually Varied Flow, Concept of Specific Energy, Sequent Depth	Lecture No 36
37	Rapidly varying flow, Concepts of Hydraulic jump	Lecture No 37
38	Flow measurement in open channel	Lecture No 38
39	Exercise for Numerical	Lecture No 39
40	Revision /Review	Lecture No 40

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