Department of Civil Engineering and Applied Mechanics
Lesson Plan
B. Tech IInd year
CE21017: BUILDING PLANNING AND ARCHITECTURE
Semester: III

Unit – 1: Building Components, Byelaws & Site Planning (7 Hours)

Lec	Topics
1	Introduction to buildings – types & components
2	Building components: foundation, walls, floors, roofs, doors & windows (definitions & functions)
3	Building regulations & bye-laws – need & objectives
4	Setbacks, open spaces & building line
5	Ground coverage & Floor Area Ratio (F.A.R.)
6	Site planning – principles
7	Infrastructure provisions – water supply, drainage, roads & services

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Unit – 2: Principles of Planning & Functional Planning (8 Hours)

Lec	Topics
8	Principles of planning – orientation
9	Climate considerations in building planning
10	Design for solar radiation
11	Ventilation – natural & artificial
12	Lighting – natural & artificial
13	Noise reduction & acoustical considerations
14	Functional planning – concept & objectives
15	Space standards for residential & public buildings, space optimization

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Unit – 3: Building Services & Staircase Design (6 Hours)

Lec	Topics
16	Introduction to building services
17	Artificial lighting systems – basics
18	Ventilation systems & sanitation
19	Staircase – types & terminology
20	Design principles of staircases
21	Building regulations related to staircases (dimensions & safety)

Unit – 4: Architecture & World Architecture (7 Hours)

Lec	Topics
22	Meaning of architecture
23	Role of architect in building planning
24	Greek architecture – features & examples
25	Roman architecture – features & examples
26	Buddhist architecture – features
27	Islamic architecture – features
28	Hindu architecture – features

Unit – 5: Architectural Composition & Drawings (8 Hours)

Lec	Topics
29	Architectural composition – elements
30	Unity, symmetry & balance
31	Proportion, scale & system characteristics
32	Texture, pattern & colour
33	Working drawings – plans

Lec	Topics
34	Elevations & sections
35	Site plan & detailing
36	Perspective drawing – elements, parallel & oblique perspective

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Lesson Plan
B. Tech IInd year
CE21012 GEODESY
Semester: III

Unit – 1: Theodolite, EDM, Total Station & GPS (7 Hours)

Lec	Topics
1	Introduction to theodolite – types & components
2	Measurement of horizontal & vertical angles
3	Errors in theodolite & precautions
4	Modern theodolite – electronic theodolite
5	EDM – principles & applications
6	Total station – components, functions & uses
7	GPS – principles, segments & applications in geodesy

Unit – 2: Tacheometry & Trigonometric Levelling (7 Hours)

Lec	Topics
8	Introduction to tacheometry & principles
9	Stadia system – fixed & movable hair methods
10	Tangential system of tacheometry
11	Radial contouring
12	Trigonometric levelling – basics
13	Determination of height & distance (base accessible)
14	Determination of height & distance (base inaccessible)

Unit – 3: Traversing & Triangulation (7 Hours)

Lec	Topics
15	Traversing – classification & methods
16	Errors in linear & angular measurements
17	Adjustment of traverse errors
18	Latitude & departure – concepts
19	Gale's traverse table
20	Triangulation – principles & classification
21	Trilateration – principles & applications

Unit – 4: Curves & Engineering Surveys (7 Hours)

Lec	Topics
22	Simple circular curves – elements & geometry
23	Setting out simple circular curves
24	Compound & reverse curves – introduction
25	Transition curves – need & types
26	Vertical curves – introduction
27	Layout of buildings
28	Alignment of roads, railways & bridges

Unit – 5: Photogrammetry & Field Astronomy (8 Hours)

Lec	Topics
29	Photogrammetry – principles & definitions
30	Classification: terrestrial & aerial photogrammetry
31	Flight planning for aerial photography
32	Scale & relief displacement of vertical photographs

Lec	Topics
33	Stereoscopic vision & parallax
34	Computation of position & length using photographs
35	Determination of elevations & photo mosaic
36	Introduction to field astronomy

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Lesson Plan
B. Tech IInd year
CE21013: STRENGTH OF MATERIALS
Semester: III

Unit – 1: Elastic Behaviour & Mechanical Properties (8 Hours)

Lec	Topics
1	Introduction to Strength of Materials, stress & strain
2	Normal & shear stresses and strains
3	Hooke's law & Poisson's ratio
4	Complementary shear & relations between elastic constants
5	Complex stresses & stresses on oblique planes
6	Principal stresses & principal planes
7	Principal strains & Mohr's circle for stress & strain
8	Mechanical properties of materials, factor of safety, working stress

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Unit – 2: Bending Moment & Shear Force (7 Hours)

Lec	Topics
9	Beams – types & loading
10	Shear force & bending moment at a section
11	S.F. & B.M. for beams under vertical loads
12	Beams under inclined loads & couples
13	Relation between load, shear force & bending moment
14	Graphical method for S.F. & B.M. diagrams
15	Numerical problems on S.F.D. & B.M.D.

Unit – 3: Stresses due to Bending (7 Hours)

Lec	Topics
16	Theory of simple bending – assumptions
17	Bending equation & stress distribution
18	Section modulus & modulus of rupture
19	Beams of varying cross section
20	Beams of uniform strength
21	Composite beams – theory
22	Numerical problems on bending stresses

Unit – 4: Deflection of Beams (7 Hours)

Lec	Topics
23	Elastic curve & uniform curvature
24	Relation between bending moment, curvature & deflection
25	Double integration method
26	Macaulay's method
27	Moment area method
28	Conjugate beam method
29	Deflection due to shear & numericals

Unit – 5: Torsion & Shear Stresses (7 Hours)

Lec	Topics
30	Theory of torsion – assumptions
31	Torsion of solid & hollow circular shafts
32	Power transmission & design of shafts
33	Combined bending & twisting

Lec	Topics
34	Compound shafts
35	Theory of shear stress in beams
36	Shear stress distribution & design of beams based on shear

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Lesson Plan
B. Tech IInd year
CE21015: ENGINEERING MATERIAL
Semester: III

Unit – 1: Bricks, Lime & Clay Products (7 Hours)

Lec	Topics
1	Introduction to building materials & classification
2	Bricks – manufacturing, characteristics & classification
3	Uses of bricks, improved bricks from inferior soils
4	Special bricks – hand moulded bricks, fly ash bricks, AAC blocks
5	Lime – classification, properties & slaking
6	Manufacture of lime, IS specifications & uses
7	Clay products – tiles, porcelain & refractory materials

Unit – 2: Glass, Timber, Plastics & Polycarbonates (8 Hours)

Lec	Topics
8	Glass – definition, constituents & manufacture
9	Classification, commercial forms & uses of glass
10	Timber – definition & uses
11	Physical & mechanical properties of timber
12	Defects in timber, seasoning & preservation
13	Plastics – classification, ingredients & properties
14	Fabrication of plastic products, PVC & CPVC pipes
15	Polycarbonates – classification & behaviour

Unit – 3: Rubber, Coatings, Laminates & Waterproofing (6 Hours)

Lec	Topics
16	Rubber – classification, uses & vulcanization
17	Compounding & reclaimed rubber
18	Organic coatings – ingredients & types
19	Special coatings – luminescent & fire-retardant
20	Laminates – types & applications
21	Adhesives & waterproofing compounds

Unit – 4: Concrete Technology & Mix Design (8 Hours)

Lec	Topics
22	Concrete – ingredients & properties
23	Cement, aggregates & admixtures
24	Workability, segregation & bleeding
25	Strength of concrete – tensile & compressive
26	Modulus of elasticity, shrinkage & creep
27	Mixing, transporting, placing & compaction
28	Finishing, curing & quality control
29	Concrete mix design – basics, factors & IS method

Unit – 5: Insulation, Acoustics & Material Science (7 Hours)

Lec	Topics
30	Heat insulating materials – classification & properties
31	Acoustic materials – sound absorption & tests
32	Acoustical treatment & noise reduction
33	Material science – inter-atomic bonds & bonding forces

Lec	Topics
34	Behaviour of materials under different loadings
35	Fatigue, creep & hardness of materials
36	Precast sandwich panel systems – EPS core panels & behaviour

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