



K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BENGALURU - 560109

DEPARTMENT OF CIVIL ENGINEERING

SESSION: 2022-2023 (ODD SEMESTER)

LESSON PLAN

NAME OF THE STAFF : Dr. VIJAYALAKSHMI AKELLA/ Mrs. AMRUTHA DHIRAJ

COURSE CODE/TITLE : 21CV33/ STRENGTH OF MATERIALS

SEMESTER/YEAR : III / II

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date	Delivery Date
MODULE 1							
1	Simple Stresses and Strain: Introduction, Properties of Materials, Stress, Strain, Hooke's law, Poisson's Ratio	L	BB	1	1	03/11/22	3/11/22
2	Stress - Strain Diagram for structural steel, Principles of superposition, Total elongation of tapering bars of circular and rectangular cross sections.	T	BB	1	2	08/11/22	8/11/22
3	Composite section, Volumetric strain, expression for volumetric strain, Elastic constants, relationship among elastic constants (No Numerical), Thermal stress and strains	L	BB	1	3	10/11/22	10/11/22
4	Tutorials	T	BB	0	3	12/11/22	10/11/22
5	Practical: Dimensionality of bricks, Water absorption, Initial rate of absorption	P	D	2	5	03/11/22	10/11/22
6	Introduction, Stress components on inclined planes	T	BB	1	6	15/11/22	12/11/22
7	General two-dimensional stress system, Principal planes and stresses,	L	BB	1	7	17/11/22	14/11/22
8	Maximum shear stresses and their planes (shear planes). Compound stress using Mohr's circle method.	T	BB	1	8	22/11/22	14/11/22



9	Practical: Specific gravity of coarse and fine aggregate.	P	D	2	10	17/11/22	17/11/22
MODULE 2							
10	Bending moment and shear force diagrams in beams: Definition of shear force and bending moment, Sign convention	L	BB	1	11	03/11/22	12/11/22
11	Relationship between loading, shear force and bending moment, Shear force and bending moment equations	T	BB	1	12	07/11/22	17/11/22
12	development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever, simply supported and overhanging beams for point loads, UDL(Uniformly Distributed Load), UVL(Uniformly Varying Load) and Couple.	L	BB	1	13	10/11/22	21/11/22
13	Practical: Fineness modulus of Fine and Coarse aggregate,	P	D	2	15	10/11/22	24/11/22
14	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever, simply supported and overhanging beams for point loads, UDL(Uniformly Distributed Load), UVL(Uniformly Varying Load) and Couple.	T	BB	1	16	14/11/22	21/11/22
15	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever, simply supported and overhanging beams for point loads, UDL(Uniformly Distributed Load), UVL(Uniformly Varying Load) and Couple.	L	BB	1	17	17/11/22	22/11/22
16	Development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever, simply supported and overhanging beams for point loads, UDL(Uniformly Distributed Load), UVL(Uniformly Varying Load) and Couple.	T	BB	1	18	21/11/22	23/11/22
17	Practical: Compressive strength tests on building blocks (brick, solid blocks and hollow blocks).	P	D	2	20	24/11/22	1/12/22
MODULE 3							
18	Bending stress in beams: Introduction -Bending stress in beam, Pure bending, Assumptions in simple bending theory	L	BB	1	21	01/12/22	24/11/22

19	derivation of Simple bending equation (Bernoulli's equation),	T	BB	1	22	05/12/22	28/11
	modulus of rupture, section modulus, Flexural rigidity, Problems	L	BB	1	23	08/12/22	28/11
20	Tutorial	T	BB	0	23	10/12/22	1/12
21	Practical: Tension test on Mild steel and HYSD bars	P	D	2	25	15/12/22	8/12
22	Derivation of Shear stress intensity equations,	T	BB	1	26	12/12/22	8/12
23	Derivation of Expressions of the shear stress intensity for rectangular, triangular and circular cross sections of the beams	L	BB	1	27	15/12/22	8/12
24	Problems on calculation of the shear stress intensities at various critical levels of T, I and Hollow rectangular cross sections of the beam.	L	BB	1	28	29/12/22	12/12
25	Practical: Compression test on HYSD, Cast iron.	P	D	2	30	22/12/22	15/12
MODULE 4							
26	Torsion: Twisting moment in shafts, simple torque theory, derivation of torsion equation	L	BB	1	31	22/11/22	15/12
27	Torsion: Twisting moment in shafts, simple torque theory, derivation of torsion equation, torsional rigidity, polar modulus	L	BB	1	32	24/11/22	15/12
28	Shear stress variation across solid circular and hollow circular sections, Problems	T	BB	1	33	06/12/22	22/12
29	Practical: Bending Test on Wood under two-point loading	P	D	2	35	01/12/22	22/12
30	Thin cylinders: Introduction: Longitudinal, circumferential (hoop) stress in thin cylinders. Expressions for longitudinal and circumferential stresses. Efficiency of longitudinal and circumferential joints. Problems on estimation of change in length, diameter and volume when the thin cylinder subjected to internal fluid pressure.	L	BB	1	36	08/12/22	24/12
31	Concept of Thick cylinders Lamé's equations applicable to thick cylinders with usual notations, calculation of longitudinal, circumferential and radial stresses – simple numerical examples.	L	BB	1	37	12/12/22	26/12

32	Sketching the variation of radial stress (pressure) and circumferential stress across the wall of thick cylinder.	T	BB	1	38	13/12/22	27/12
33	Practical: Shear Test on Mild steel – single and double shear	P	D	2	40	08/12/22	29/12
MODULE 5							
34	Elastic stability of columns: Introduction – Short and long columns, Euler's theory on columns, Effective length, slenderness ratio, radii of gyration, buckling load, Assumptions	L	BB	1	41	15/12/22	29/12/22
35	Derivations of Euler's Buckling load for different boundary conditions,	L	BB	1	42	20/12/22	2/1/23 3,5/1/23
36	Limitations of Euler's theory, Rankine's formula and related problems.	L	BB	1	43	22/12/22	12/1/23
37	Practical: Impact test on Mild Steel (Charpy)	P	D	2	45	29/12/22	12/1/23
38	Deflection of determinate Beams: Introduction, Elastic curve –Derivation of differential equation of flexure, Sign convention	L	BB	1	46	22/12/22	16/1/23 19/1/23, 19/1
39	Slope and deflection using Macaulay's method for statically determinate beams subjected to various vertical loads, moment, couple and their combinations. Numerical problems.	L	BB	1	47	27/12/22	19/1/23 23/1/23
40	Slope and deflection using Macaulay's method for statically determinate beams subjected to various vertical loads, moment, couple and their combinations. Numerical problems.	L	BB	1	48	29/12/22	29/1/23 30/1/23 31/1/23
41	Practical: Impact test on Mild Steel (Izod)	P	D	2	50	05/01/23	19/1/23
42	Tutorial	L	BB	0	50	31/12/22	7/2/23
43	Revision	L	BB	0	50	05/01/23	13/2
44	Revision	L	BB	0	50	09/01/23	14/2
45	Revision	L	BB	0	50	10/01/23	16/2
46	Revision	L	BB	0	50	12/01/23	20/2
47	Revision (lab)	P	D	0	50	12/01/23	11/2/23

48	Revision	L	BB	0	50	12/01/23	13/2
49	Revision	L	BB	0	50	16/01/23	14/2
50	Revision	L	BB	0	50	17/01/23	16/2
51	Revision	L	BB	0	50	19/01/23	21/2
52	Revision (lab)	P	D	0	50	19/01/23	16/2/23
53	Revision	L	BB	0	50	19/01/23	27/2
54	Revision	L	BB	0	50	23/01/23	28/2
55	Revision	L	BB	0	50	24/01/23	9/3
56	Revision (lab)	L	BB	0	50	30/01/23	21/3/23
57	Revision	L	BB	0	50	31/01/23	9/3/23
58	Revision	L	BB	0	50	07/02/23	13/3
59	Revision	L	BB	0	50	11/02/23	20/3
60	Revision (lab)	L	BB	0	50	11/02/23	23/3
61	Revision	L	BB	0	50	11/02/23	23/3

	Week	Remarks
Assignment 1	(4 th week)	Written (24/11/22)
Assignment 2	(9 th week)	Written (29/12/22)

Total No. of Lecture Hours = 20;

Total No. of Tutorial Hours = 10+2;

Total No. of Practical Hours = 20;

Total No. of Revision Hours = 22

[Signature]
Course In charge

[Signature]
Head of Dept

[Signature]
IQAC Coordinator

[Signature]
Principal

Professor & Head
Dept. of Civil Engineering
K.S. Group of Institutions
K.S. School of Engineering & Management
Bangalore-560 062.

Principal / Director
K.S. School of Engineering & Management
Bangalore-560 062

