

RAJA KISHORE CHANDRA ACADEMY OF TECHNOLOGY

NILGIRI, BALASORE

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

SUBJECT - - STRENGTH OF MATERIAL

BRANCH-MECHANICAL

NAME OF THE FACULTY-ER.SANJAY KUMAR BEHERA

SEMESTER-3RD

SESSION- 2024-25

MODULE	DATE	LECTURE NO	TOPIC TO BE COVERED
1		1	TYPES OF LOAD, STRESSES & STRAINS,(AXIAL AND TANGENTIAL) HOOKE'S LAW
		2	YOUNG'S MODULUS, BULK MODULUS, MODULUS OF RIGIDITY, POISSON'S RATIO, DERIVE THE RELATION BETWEEN THREE ELASTIC CONSTANT
		3	PRINCIPLE OF SUPER POSITION, STRESSES IN COMPOSITE SECTION
		4	STRESS STRAIN CURVE FOR DUCTILE AND BRITTLE MATERIAL
		5	YIELD POINT, PLASTIC STAGE, ULTIMATE BREAKING STRESS PERCENTAGE ELONGATION, PROOF AND WORKING STRESS
		6	FACTORS OF SAFETY, POISSON'S RATIO, THERMAL STRESS AND STRAIN, INTRODUCTION TO PRINCIPAL STRESSES
		7	RESILIENCE STRAIN ENERGY, RESILIENCE, PROOF RESILIENCE AND MODULUS OF RESILIENCE
		8	STRESS DUE TO GRADUAL, SUDDEN AND FALLING LOAD
		9	SIMPLE PROBLEMS ON ABOVE.
		10	SIMPLE PROBLEMS ON ABOVE.
2		11	DEFINITION OF HOOP AND LONGITUDINAL STRESS, STRAIN
		12	DERIVATION OF HOOP STRESS,
		13	DERIVATION OF LONGITUDINAL STRESS,
		14	DERIVATION OF LONGITUDINAL STRAIN AND VOLUMETRIC STRAIN
		15	COMPUTATION OF THE CHANGE IN LENGTH,
		16	COMPUTATION OF THE CHANGE IN DIAMETER AND VOLUME
		17	SIMPLE PROBLEMS ON ABOVE
		18	SIMPLE PROBLEMS ON ABOVE
3		19	DETERMINATION OF PRINCIPAL PLANES AND PRINCIPAL STRESS
		20	ANALYTICAL METHOD FOR THE STRESSES ON AN OBLIQUE SECTION OF A BODY
		21	SIGN CONVENTION FOR ANALYTICAL METHOD
		22	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN ONE PLANE
		23	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN TWO MUTUALLY PERPENDICULAR DIRECTION
		24	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN TWO MUTUALLY PERPENDICULAR DIRECTION ACCOMPANIED BY A SIMPLE SHEAR STRESS
		25	MAXIMUM SHEAR STRESS USING MOHR'S CIRCLE
		26	SIMPLE PROBLEMS ON ABOVE.
		27	SIMPLE PROBLEMS ON ABOVE.
		28	PREVIOUS SEMESTER QUESTION DISCUSSION
4		29	TYPES OF BEAM AND LOAD

		30	BENDING MOMENT AND SHEARING FORCE CONCEPT OF VARIOUS TYPES OF BEAMS AND LOADING
		31	CONCEPT OF END SUPPORTS, HINGED AND FIXED, CONCEPT OF BENDING MOMENT AND SHEAR FORCE
		32	B.M AND S.F DIAGRAM FOR CANTILEVER BEAM WITH POINT LOAD
		33	B.M. AND S.F DIAGRAM FOR SIMPLY SUPPORTED BEAM WITH POINT LOAD
		34	B.M AND S.F DIAGRAM OF CANTILEVER AND SIMPLY SUPPORTED BEAMS WITH U.D.L & POINT OF CONTRAFLEXURE
		35	B.M. AND S.F DIAGRAM FOR SIMPLY SUPPORTED BEAM WITH U.D.L
		36	B.M. AND S.F DIAGRAM FOR OVER HANGING BEAM WITH POINT LOAD
		37	B.M. AND S.F DIAGRAM FOR OVER HANGING BEAM WITH U.D.L
		38	SIMPLE PROBLEMS ON ABOVE.
		39	SIMPLE PROBLEMS ON ABOVE.
		40	PREVIOUS SEMESTER QUESTION DISCUSSION
5		41	BENDING STRESS CONCEPTS OF BENDING STRESSES
		42	THEORY OF SIMPLE BENDING, DERIVATION OF BENDING EQUATION
		43	CONCEPT OF MOMENT OF RESISTANCE
		44	BENDING STRESS DIAGRAM, SECTION MODULUS.
		45	SECTION MODULUS FOR CIRCULAR AND RECTANGULAR BEAMS
		46	SIMPLE PROBLEMS ON ABOVE.
		47	SIMPLE PROBLEMS ON ABOVE.
6		48	CONCEPT OF COLUMN, MODES OF FAILURE, TYPES OF COLUMNS, MODES OF FAILURE OF COLUMN
		49	BUCKLING LOAD, CRUSHING LOAD, SLENDERNESS RATIO
		50	EFFECTIVE LENGTH, END RESTRAINTS
		51	FACTOR EFFECTING STRENGTH OF A COLUMN, STRENGTH OF COLUMN BY EULER FORMULA WITHOUT DERIVATION
		52	SIMPLE PROBLEMS ON ABOVE.
		53	SIMPLE PROBLEMS ON ABOVE.
		54	PREVIOUS SEMESTER QUESTION DISCUSSION
7		55	ASSUMPTION OF PURE TORSION
		56	THE TORSION EQUATION FOR SOLID AND HOLLOW CIRCULAR SHAFT
		57	COMPARISON BETWEEN SOLID AND HOLLOW SHAFT SUBJECTED TO PURE TORSION
		58	SIMPLE PROBLEMS ON ABOVE.
		59	DOUBT CLEARING CLASS
		60	DOUBT CLEARING CLASS
		61	CLASS TEST & DISCUSSION ON QUESTION
		62	DISCUSSION OF SELECTED PROBABLE QUESTIONS
		63	DISCUSSION OF SELECTED PROBABLE QUESTIONS
		64	PREVIOUS SEMESTER QUESTION DISCUSSION
		65	PREVIOUS SEMESTER QUESTION DISCUSSION

SIGNATURE OF FACULTY MEMBER

COUNTER SIGNATURE OF H.O.D

