

TH2

GOVT. POLYTECHNIC, DHENKANAL

LESSON PLAN: STRENGTH OF MATERIAL, 3rd SEMESTER – 2024

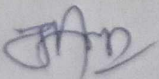
Discipline: Mechanical Engineering	Semester: 3 RD	Name of the teaching faculty: PRADEEP KUMAR JENA
Subject: SOM	No of days/per week class allotted: 04	Semester From Date: 16/08/2024 To Date: 16/12/2024 No of weeks: 15
Week:	Class day:	Theory/Practical Topics To be Covered
1ST	1ST	TYPES OF LOAD, STRESSES & STRAINS, (AXIAL AND TANGENTIAL) HOOKE'S LAW
	2ND	YOUNG'S MODULUS, BULK MODULUS, MODULUS OF RIGIDITY, POISSON'S RATIO, DERIVE THE RELATION BETWEEN THREE ELASTIC CONSTANT
	3RD	PRINCIPLE OF SUPERPOSITION, STRESSES IN COMPOSITE SECTION
	4TH	STRESS Vs STRAIN CURVE FOR DUCTILE AND BRITTLE MATERIAL
2ND	1ST	YIELD POINT, PLASTIC STAGE, ULTIMATE BREAKING STRESS PERCENTAGE ELONGATION, PROOF AND WORKING STRESS
	2ND	FACTORS OF SAFETY, POISSON'S RATIO, THERMAL STRESS AND STRAIN, INTRODUCTION TO PRINCIPAL STRESSES
	3RD	RESILIENCE STRAIN ENERGY, RESILIENCE, PROOF RESILIENCE AND MODULUS OF RESILIENCE
	4TH	STRESS DUE TO GRADUAL, SUDDEN AND FALLING LOAD
3RD	1ST	SIMPLE PROBLEMS ON ABOVE.
	2ND	SIMPLE PROBLEMS ON ABOVE.

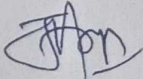
	3 RD	DEFINITION OF HOOP AND LONGITUDINAL STRESS, STRAIN
	4 TH	DERIVATION OF HOOP STRESS,
4 TH	1 ST	DERIVATION OF LONGITUDINAL STRESS,
	2 ND	DERIVATION OF LONGITUDINAL STRAIN AND VOLUMETRIC STRAIN
	3 RD	COMPUTATION OF THE CHANGE IN LENGTH,
	4 TH	COMPUTATION OF THE CHANGE IN DIAMETER AND VOLUME
5 TH	1 ST	SIMPLE PROBLEMS ON ABOVE
	2 ND	SIMPLE PROBLEMS ON ABOVE
	3 RD	DETERMINATION OF PRINCIPAL PLANES AND PRINCIPAL STRESS
	4 TH	ANALYTICAL METHOD FOR THE STRESSES ON AN OBLIQUE SECTION OF A BODY
6 TH	1 ST	SIGN CONVENTION FOR ANALYTICAL METHOD
	2 ND	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN ONE PLANE
	3 RD	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN TWO MUTUALLY PERPENDICULAR DIRECTION

	4 TH	STRESSES ON AN OBLIQUE PLANE OF A BODY SUBJECTED TO A DIRECT STRESS IN TWO MUTUALLY PERPENDICULAR DIRECTION ACCOMPANIED BY A SIMPLE SHEAR STRESS
7 TH	1 ST	MAXIMUM SHEAR STRESS USING MOHR'S CIRCLE
	2 ND	SIMPLE PROBLEMS ON ABOVE.
	3 RD	SIMPLE PROBLEMS ON ABOVE.
	4 TH	PREVIOUS SEMESTER QUESTION DISCUSSION
8 TH	1 ST	TYPES OF BEAM AND LOAD
	2 ND	BENDING MOMENT AND SHEARING FORCE CONCEPT OF VARIOUS TYPES OF BEAMS AND LOADING
	3 RD	CONCEPT OF END SUPPORTS, HINGED AND FIXED, CONCEPT OF BENDING MOMENT AND SHEAR FORCE
	4 TH	B.M. AND S.F. DIAGRAM FOR CANTILEVER BEAM WITH POINT LOAD
9 TH	1 ST	B.M. AND S.F. DIAGRAM FOR SIMPLY SUPPORTED BEAM WITH POINT LOAD
	2 ND	B.M. AND S.F. DIAGRAM OF CANTILEVER AND SIMPLY SUPPORTED BEAMS WITH U.D.L. & POINT OF CONTRAFLEXURE
	3 RD	B.M. AND S.F. DIAGRAM FOR SIMPLY SUPPORTED BEAM WITH U.D.L.
	4 TH	B.M. AND S.F. DIAGRAM FOR OVERHANGING BEAM WITH POINT LOAD

10 TH	1 ST	B.M. AND S.F. DIAGRAM FOR OVERHANGING BEAM WITH U.D.L
	2 ND	SIMPLE PROBLEMS ON ABOVE.
	3 RD	SIMPLE PROBLEMS ON ABOVE.
	4 TH	PREVIOUS SEMESTER QUESTION DISCUSSION
11 TH	1 ST	BENDING STRESS CONCEPTS OF BENDING STRESSES
	2 ND	THEORY OF SIMPLE BENDING, DERIVATION OF BENDING EQUATION
	3 RD	CONCEPT OF MOMENT OF RESISTANCE
	4 TH	BENDING STRESS DIAGRAM, SECTION MODULUS.
12 TH	1 ST	SECTION MODULUS FOR CIRCULAR AND RECTANGULAR BEAMS
	2 ND	SIMPLE PROBLEMS ON ABOVE.
	3 RD	SIMPLE PROBLEMS ON ABOVE.
	4 TH	CONCEPT OF COLUMN, MODES OF FAILURE, TYPES OF COLUMNS, MODES OF FAILURE OF COLUMN
13 TH	1 ST	BUCKLING LOAD, CRUSHING LOAD, SLENDERNESS RATIO

	2 ND	EFFECTIVE LENGTH, END RESTRAINTS
	3 RD	FACTOR EFFECTING STRENGTH OF A COLUMN , STRENGTH OF COLUMN BY EULER FORMULA WITH OUT DERIVATION
	4 TH	ASSUMPTION OF PURE TORSION
14 TH	1 ST	THE TORSION EQUATION FOR SOLID AND HOLLOW CIRCULAR SHAFT
	2 ND	COMPARISON BETWEEN SOLID AND HOLLOW SHAFT SUBJECTED TO PURE TORSION
	3 RD	SIMPLE PROBLEMS ON ABOVE.
	4 TH	PREVIOUS SEMESTER QUESTION DISCUSSION
15 TH	1 ST	PREVIOUS SEMESTER QUESTION DISCUSSION
	2 ND	PREVIOUS SEMESTER QUESTION DISCUSSION
	3 RD	PREVIOUS SEMESTER QUESTION DISCUSSION
	4 TH	PREVIOUS SEMESTER QUESTION DISCUSSION


 Sign. of Faculty Concerned


 Sign of HOD