**LESSON PLAN**

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| Name of faculty :- | Sh Vipin Kumar |
| Discipline :- | Mech. Engg. |
| Semester :- | 3rd |
| Subject :- | SOM |

Lesson plan duration :- 15 weeks( Sept 2023 to Jan 2024)

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| WEEK |  | THEORY | PRACTICAL |  |
|  |  |  |  |  |
|  | **LECTURE DAY** | ***Topic (Including Assignment/test)*** | **PRACTICAL DAY** | **Topic** |
|  |  |  |  |  |
| 1stweek | 1st day | *Unit 1 :* ***Stresses and Strains*** | 1st day | 1.Tensile test of mild steel |
|  |  | *Basics concept of load, stress and strain* |  | bar |
|  |  |  |  |  |
|  | 2ndday | *Tensile, compressive, shear stress* |  |  |
|  |  |  |  |  |
|  | 3rdday | *Linear, lateral, shear, volumetric strain* |  |  |
|  |  | *Concept of elasticity, elastic limit, limit of* |  |  |
|  |  | *proportionality* |  |  |
|  |  |  |  |  |
| 2ndweek | 1st day | *Hooks law, elastic constant, nominal* | 1st day | 2.Tensile test of aluminum |
|  |  | *strain* |  | bar |
|  |  |  |  |  |
|  | 2ndday | *stress strain curve for ductile and brittle* |  |  |
|  |  | *material* |  |  |
|  |  |  |  |  |
|  | 3rdday | *Yield point, plastic stage, ultimate and* |  |  |
|  |  | *breaking stress Percentage elongation,* |  |  |
|  |  | *proof and working stress* |  |  |
|  |  |  |  |  |
| 3rd week | 1st day | *Factor of safety, poison’s ratio, thermal* | 1st day | Revision of practical 1 |
|  |  | *stress and strain, introduction to principal* |  |  |
|  |  | *stresses* |  |  |
|  |  |  |  |  |
|  | 2ndday | *Longitudinal and circumferential stresses* |  |  |
|  |  | *in seamless thin walled cylindrical shells* |  |  |
|  | 3rdday | *Unit2:* ***Resilience*** |  |  |
|  |  | *strain energy, resilience, proof* |  |  |
|  |  | *resilience and modulus of resilience* |  |  |
|  |  |  |  |  |
| 4th week | 1st day | *Strain energy due to direct stress and* | 1st day | Revision of practical 2 |
|  |  | *shear stress* |  |  |
|  |  |  |  |  |
|  | 2nd day | *Stress due to gradual, sudden and falling* |  |  |
|  |  | *load* |  |  |
|  |  |  |  |  |
|  | 3rd day | *Unit3:* ***Moment of Inertia***  *concept of moment of inertia and second*  *moment of inertia, Radius of gyration,* |  |  |

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| 5th week |  | 1st day | *Theorem of perpendicular Axis and parallel Axis* |  | 1st day | 3. Bending tests on a steel |  |
|  |  |  |  |  |  | bar |  |
|  |  |  |  |  |  |  |  |
|  |  | 2nd day | *Second moment of area of rectangle* |  |  |  |  |
|  |  |  | *,triangle, circle and numerical of these* |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 3rdday | *Second moment of area for L,T,I and* |  |  |  |  |
|  |  |  | *numerical Section modulus* |  |  |  |  |
|  |  |  |  |  | |  |  |
| 6th week |  | 1st day | *Numerical problems and revision* | 1st day | | 4. Bending tests on wooden |  |
|  |  |  |  |  |  | bar |  |
|  |  | 2nd day | *Unit4:* ***Bending Moment and Shearing*** |  |  |  |  |
|  |  |  | ***Fours*** |  |  |  |  |
|  |  |  | *concept of various types of beams and* |  |  |  |  |
|  |  |  | *loading* |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 3rdday | *Concept of end supports, hinged and* |  |  |  |  |
|  |  |  | *fixed, Concept of bending moment and* |  |  |  |  |
|  |  |  | *shear force* |  |  |  |  |
|  |  |  |  |  | |  |  |
| 7th week |  | 1st day | *B.M and S.F diagram for cantilever beam* | 1st day | | 5. Impact test on IZOD test |  |
|  |  |  |  |  |  |  |  |
|  |  | 2nd day | *B.M. and S.F diagram for simply* |  |  |  |  |
|  |  |  | *supported beam* |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 3rdday | *B.M and S.F diagram of cantilever and* |  |  |  |  |
|  |  |  | *simply supported beams with or without* |  |  |  |  |
|  |  |  | *overhang and U.D.L* |  |  |  |  |
|  |  |  |  |  | |  |  |
| 8th week |  | 1st day | *Numerical problems* | 1st day | | 6. Impact test on CHARPY |  |
|  |  |  |  |  |  | test |  |
|  |  | 2nd day | *Unit5:* ***Bending Stresses*** |  |  |  |
|  |  |  |  |  |  |
|  |  |  | *concepts of bending stresses* |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 3rdday | *Theory of simple bending , Derivation of* |  |  |  |  |
|  |  |  | *bending equation* |  |  |  |  |
|  |  |  |  |  | |  |  |
| 9th week |  | 1st day | *Concept of moment of resistance* | 1st day | | 7. Torsion test of solid |  |
|  |  |  |  |  |  | specimen of circular section |  |
|  |  |  |  |  |  | of different metals for |  |
|  |  |  |  |  |  | determining modulus of |  |
|  |  | 2nd day | *Bending stress diagram, section modulus* |  |  |  |
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|  |  | *for rectangles* |  | rigidity |  |
|  |  |  |  |  |  |
|  | 3rdday | *Section modulus for circular and* |  |  |  |
|  |  | *symmetrical I section, Bending stress in* |  |  |  |
|  |  | *beams of rectangular* |  |  |  |
|  |  |  |  |  |  |
| 10th week | 1st day | *Bending stress in circular and T section* | 1st day | Revision of practical 7 |  |
|  |  |  |  |  |  |
|  | 2nd day | *Numerical and revision* |  |  |  |
|  |  |  |  |  |  |
|  | 3rdday | *Unit6:* ***Columns*** |  |  |  |
|  |  | *concept of column, modes of failure,* |  |  |  |
|  |  | *Types of columns, modes of failure of* |  |  |  |
|  |  | *column* |  |  |  |
|  |  |  |  |  |  |
| 11th week | 1st day | *Buckling load, crushing load, slenderness* | 1st day | 8. To plot a graph between |  |
|  |  | *ratio* |  | load and extension and to |  |
|  |  |  |  | determine the stiffness of a |  |
|  | 2nd day | *Effective length, end restraints* |  |  |
|  |  | helical spring |  |
|  |  |  |  |  |
|  |  |  |  |  |  |
|  | 3rdday | *Factor effecting strength of a column,* |  |  |  |
|  |  | *Strength of column by Euler formula* |  |  |  |
|  |  | *without derivation* |  |  |  |
|  |  |  |  |  |  |
| 12th week | 1st day | *Rankin gourdan formula* | 1st day | Revision of practical 8 |  |
|  |  |  |  |  |  |
|  | 2nd day | *Unit7:* ***Torsion*** |  |  |  |
|  |  | *concept of torsion, difference between* |  |  |  |
|  |  | *torque and torsion* |  |  |  |
|  |  |  |  |  |  |
|  | 3rdday | *Derivation of torsion equation, Use of* |  |  |  |
|  |  | *torsion equation for circular shaft (solid* |  |  |  |
|  |  | *and hollow)* |  |  |  |
|  |  |  |  |  |  |
| 13th week | 1st day | *Comparison of solid and hollow shaft* | 1st day | 9. hardness test on different |  |
|  |  |  |  | material |  |
|  | 2nd day | *Power transmitted by shaft* |  |  |  |
|  |  |  |  |  |  |
|  | 3rdday | *Concept of mean and maximum torque* |  |  |  |
|  |  |  |  |  |  |
| 14th week | 1st day | *Unit8:* ***Springs*** | 1st day | Revision of practical 9 |  |
|  |  | *closed coil helical springs subjected to* |  |  |  |
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|  | |  |  | *axial load* |  |  |  |
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|  | |  | 2nd day | *Calculation of stress deformation* |  |  |  |
|  | |  |  |  |  |  |  |
|  | |  | 3rdday | *Stiffness, angle of twist, strain energy* |  |  |  |
|  | | |  |  |  |  |  |
| 15th week | | | 1st day | *Numerical problems* | 1st day | Revision |  |
|  | |  |  |  |  |  |  |
|  | |  | 2nd day | *Determination of number of plates of* |  |  |
|  | |  |  |  |  |
|  | |  |  | *laminated springs* |  |  |  |
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|  | |  | 3rdday | *Revision, Discuss on problems* |  |  |  |
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