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| Discipline  :**MECHANICALE NGG** | Semeste r :**3rd** | Name of the Teaching Faculty: **ANTARYAMI BERA** |
| Subject:**STRENGT H OF MATERIAL** | No. of days/per week class allotted: **04** | No. of Weeks: **15**  Semester From date : **15.09.2022** To Date:**22.12.2022** |
| Week | Class Day | Theory / Practical Topics |
| 1ST | 1ST | Types of load, stresses & strains,(Axial and tangential), |
|  | 2ND | Hooke’s law, Young’s modulus, bulk modulus, modulus of rigidity, |
|  | 3RD | Poisson’s ratio, derive the relation between three elastic constants |
|  | 4TH | Principle of super position, stresses in composite section |
| 2ND | 1ST | Temperature stress, determine the temperature stress in composite bar (single core) |
|  | 2ND | Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load |
|  | 3RD | Strain energy and resilience, Stress due to gradually applied, suddenly  applied and impact load |
|  | 4TH | Simple problems on above |
| 3RD | 1ST | Simple problems on above |
|  | 2ND | Simple problems on above |
|  | 3RD | Definitionofhoopandlongitudinalstress,strain |
|  | 4TH | Definitionofhoopandlongitudinalstress,strain |
| 4TH | 1ST | Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain |
|  | 2ND | Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain |
|  | 3RD | Computation of the change in length, diameter and volume |
|  | 4TH | Simple problems on above |
| 5TH | 1ST | Simple problems on above |
|  | 2ND | Simple problems on above |
|  | 3RD | Determinationofnormalstress,shearstressandresultantstre ssonobliqueplane |
|  | 4TH | Determination of normal stress, shear stress and resultant stress on oblique  plane |
| 6TH | 1ST | Determination of normal stress, shear stress and resultant stress on oblique plane |
|  | 2ND | Location of principal plane and computation of principal stress |
|  | 3RD | Location of principal plane and computation of principal stress |
|  | 4TH | Location of principal plane and computation of principal stress |
| 7TH | 1ST | Locationofprincipalplaneandcomputationofprincipalstressand Maximum shear stress using Mohr’s circle |
|  | 2ND | Locationofprincipalplaneandcomputationofprincipalstressand Maximum shear stress using Mohr’s circle |
|  | 3RD | Locationofprincipalplaneandcomputationofprincipalstressand Maximum shear stress using Mohr’s circle |
|  | 4TH | Locationofprincipalplaneandcomputationofprincipalstressand Maximum |

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|  |  | shear stress using Mohr’s circle |
| 8TH | 1ST | Types of beam and load |
|  | 2ND | Types of beam and load |
|  | 3RD | Types of beam and load |
|  | 4TH | ConceptsofShearforceandbendingmoment |
| 9TH | 1ST | ConceptsofShearforceandbendingmoment |
|  | 2ND | ConceptsofShearforceandbendingmoment |
|  | 3RD | ShearForceandBendingmomentdiagramanditssalientfeaturesillustration in  cantilever beam, simply supported beam and  overhangingbeamunderpointloadanduniformlydistributedl oad |
|  | 4TH | ShearForceandBendingmomentdiagramanditssalientfeaturesillustration in cantilever beam, simply supported beam and overhangingbeamunderpointloadanduniformlydistributedload |
| 10TH | 1ST | ShearForceandBendingmomentdiagramanditssalientfeaturesillustration in cantilever beam, simply supported beam and overhangingbeamunderpointloadanduniformlydistributedload |
|  | 2ND | ShearForceandBendingmomentdiagramanditssalientfeaturesillustration in  cantilever beam, simply supported beam and overhangingbeamunderpointloadanduniformlydistributedl  oad |
|  | 3RD | Assumptionsinthetheoryofbending, |
|  | 4TH | Assumptionsinthetheoryofbending, |
| 11TH | 1ST | Bendingequation,Momentofresistance,Sectionmodulus&neutralaxis. |
|  | 2ND | Bendingequation,Momentofresistance,Sectionmodulus&neutralaxis. |
|  | 3RD | Bendingequation,Momentofresistance,Sectionmodulus&neutralaxis. |
|  | 4TH | Solvesimpleproblems |
| 12TH | 1ST | Solvesimpleproblems |
|  | 2ND | Solvesimpleproblems |
|  | 3RD | Solvesimpleproblems |
|  | 4TH | Solvesimpleproblems |
| 13TH | 1ST | Definecolumn |
|  | 2ND | Axialload,Eccentricloadoncolumn |
|  | 3RD | Directstresses,Bendingstresses,Maximum&Minimumstresses.Numeric al  problemson above. |
|  | 4TH | Directstresses,Bendingstresses,Maximum&Minimumstresses.Nu merical problemson above. |
| 14TH | 1ST | BucklingloadcomputationusingEuler’sformula(noderivat ion)inColumns withvariousendconditions |
|  | 2ND | BucklingloadcomputationusingEuler’sformula(noderivat ion)inColumns withvariousendconditions |
|  | 3RD | Assumptionofpuretorsion |
|  | 4TH | Thetorsionequationforsolidandhollowcircularshaft |
| 15TH | 1ST | Thetorsionequationforsolidandhollowcircularshaft |

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|  | 2ND | Thetorsionequationforsolidandhollowcircularshaft |
|  | 3RD | Comparison between solid and hollow shaft subjected to pure torsion |
|  | 4TH | Comparison between solid and hollow shaft subjected to pure torsion |

**Learning Resouces:**

1. StrengthofMaterials, bySRamamrutham,DhanpatRai
2. StrengthofMaterialsbyRKRajput, S.Chand
3. StrengthofMaterials, byR.Skhurmi, , S.Chand
4. StrengthofMaterials,byGHRyder, Mcmillonandco.lmtd
5. StrengthofMaterials by STimoshenkoandDH,TMH

**ANTARYAMI BERA Mech. Engg. Dept.**