# LESSON PLAN

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| **DISCIPLINE:**<br>**MECHANICAL ENGINEERING** | **SEMESTER:5th(2020-21)** | **NAME OF THE FACULTY:**<br>**GOBIND CHANDRA BARIK** |
| **SUBJECT:**<br>**DESIGN OF MACHINE ELEMENTS(TH-2)** | **NO. OF DAYS/WEEK CLASS ALLOTTED:**<br>**4P/WEEK** | **SEMESTER FROM DATE:**<br>**TO DATE:**<br>**NO. OF WEEKS: 15** |

| Sl No. | week | Day | Topics to be covered |
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| 1 | 1st | 1st day | Introduction to Machine Design and Classification. |
| | | 2nd day | Different mechanical engineering materials used in design. |
| | | 3rd day | mechanical and physical properties of materials. |
| | | 4th day | Defination of working stress, yield stress. |
| 2 | 2nd | 1st day | ultimate stress & factor of safety of materials. |
| | | 2nd day | stress –strain curve for M.S & C.I |
| | | 3rd day | Modes of failure during design consideration. |
| | | 4th day | Failure caused by elastic deflection, general yielding & fracture |
| 3 | 3rd | 1st day | factors governing the design of machine elements. |
| | | 2nd day | Precautions to be taken before design. |
| | | 3rd day | Describe design procedure. |
| | | 4th day | Design procedures. |
| 4 | 4th | 1st day | Joints and their classification. |
| | | 2nd day | State types of welded joints. |
| | | 3rd day | Arc welding,gas welding and resistance welding. |
| | | 4th day | State advantages of welded joints over other joints. |
| 5 | 5th | 1st day | Design of welded joints for eccentric loads. |
| | | 2nd day | State types of rivetes |

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| | | 3rd day | State types of riveted joints. |
| | | 4th day | Describe failure of riveted joints. |
| 6 | 6th | 1st day | Determine strength & efficiency of riveted joints. |
| | | 2nd day | Design riveted joints for pressure vessel. |
| | | 3rd day | Solve numerical on Welded Joints. |
| | | 4th day | Numericals on riveted joints. |
| 7 | 7th | 1st day | State function of shafts and materials for shafts. |
| | | 2nd day | Design solid shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity. |
| | | 3rd day | Design of hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity. |
| | | 4th day | State standard size of shaft as per I.S. |
| 8 | 8th | 1st day | State function of keys, types of keys. |
| | | 2nd day | Materials used for making of key. |
| | | 3rd day | Describe failure of key, effect of key way. |
| | | 4th day | Design rectangular sunk key considering its failure against shear & crushing. |
| 9 | 9th | 1st day | Design rectangular sunk key by using empirical relation for given diameter of shaft. |
| | | 2nd day | State specification of parallel key, gib-head key, taper key as per I.S. |
| | | 3rd day | Solve numerical on Design of Shaft. |
| | | 4th day | Solve numerical on Design of keys. |
| 10 | 10th | 1st day | Design of Shaft Coupling |
| | | 2nd day | Design of Shaft Coupling |
| | | 3rd day | Requirements of a good shaft coupling. |
| | | 4th day | Types of Coupling. |
| 11 | 11th | 1st day | Sleeve, muff and flange coupling. |
| | | 2nd day | Design of Sleeve or Muff-Coupling. |

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| | | 3rd day | Problems on Sleeve or Muff-Coupling. |
| | | 4th day | Design of Clamp or Compression Coupling. |
| 12 | 12th | 1st day | Factors affecting the design of coupling |
| | | 2nd day | Problems on Clamp or Compression Coupling. |
| | | 3rd day | Problems on hollow shaft coupling. |
| | | 4th day | Problems on solid shaft coupling. |
| 13 | 13th | 1st day | Introduction to closed coil helical spring. |
| | | 2nd day | Materials used for helical spring. |
| | | 3rd day | Standard size spring wire. (SWG). |
| | | 4th day | Terms used in compression spring. |
| 14 | 14th | 1st day | Spring strength and stiffness. |
| | | 2nd day | Stress in helical spring of a circular wire |
| | | 3rd day | Design of helical springs. |
| | | 4th day | Deflection of helical spring of circular wire. |
| 15 | 15th | 1st day | Effect of deflection in spring. |
| | | 2nd day | Surge in spring. |
| | | 3rd day | Effect of surge in springs. |
| | | 4th day | Solve numerical on design of closed coil helical compression spring. |