**LESSON PLAN FOR DESIGN OF MACHINE ELEMENTS**

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| **ACADEMIC YEAR: 2024-25** | | |
| **Mechanical Engineering** | **5th semester** | **ER.KALIASETHI** |
| **DESIGN OF MACHINE ELEMENTS** | Lecture: 04/week | Semester :5TH |
| No. of weeks :15 |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1 | 1ST (CH1) | Introduction to Machine Design , course outcomes. |
| 2nd | Classification of machine design, Stresses related to machine design, Stress concentration |
| 3rd | Engineering materials used in design, properties of material. |
| 4th | Stress- strain curve for ductile and brittle material( Mild steel& Cast iron) |
| 2 | 1st | Working stress, yield stress, ultimate stress. Factor of safety for ductile and brittle material. |
| 2nd | Modes of failure(elastic deflection, yielding & fracture) |
| 3rd | Factors governing the design of machine elements |
| 4th | General procedure in machine design |
| 3 | 1ST (CH2) | Fastening elements and types of fastening |
| 2nd | Welding and types of welded joints. |
| 3rd | Advantages and disadvantages of welded joints over other joints |
| 4th | Strength of transeverse and parallel fillet welded joint |
| 4 | 1st | Simple numericals on welding joint |
| 2nd | Design of welded joints for eccentric loads |
| 3rd | Different cases of eccentric load and derivations |
| 4th | Numerical on eccentric loaded welding joint. |
| 5 | 1st | Riveted joint, types of riveted joint. |
| 2nd | Failures of riveted joint. |
| 3rd | Determination of strength and efficiency of riveted joint. |
| 4th | Design of riveted joint for pressure vessel(boiler) |
| 6 | 1st | Numerical on design of riveted joints. |
| 2nd | Numerical on design of riveted joints. |
| 3rd | Class test. |
| 4TH (CH3) | Introduction to shaft,functions,materials of shaft |
| 7 | 1st | Design of shaft on basis of strength |
| 2nd | Design of shaft on basis of strength |
| 3rd | Design of shaft on basis of rigidity |
| 4th | Design of shaft on basis of rigidity |
| 8 | 1st | Numericals on design of shafts |
| 2nd | Numericals on design of shafts |
| 3rd | function of keys, types of keys |
| 4th | Material of keys, Failures of key,causes,effect of key way |
| 9 | 1st | Design rectangular sunk key and solving numericals |
| 2nd | Design rectangular sunk key and solving numericals |
| 3rd | Numericals on empirical relation of rectangular sunk key |
| 4th | Specifications of parallel,gibhead,taper key |
| 10 | 1st | Class work on key and shaft |
| 2nd (CH4) | Introduction to coupling, design of shaft coupling |
| 3rd | Requirements of a good shaft coupling. Types of coupling. |
| 4th | Design of sleeve coupling |
| 11 | 1st | Design of clamp or compression coupling |
| 2nd | Numerical on design of coupling. |
| 3rd | Numerical on design of coupling. |
| 4th (CH5) | Introduction to spring and types(open and closed) |
| 12 | 1st | Materials used and application of spring |
| 2nd | SWG ,specifications of spring. |
| 3rd | Spring terms for compression type |
| 4th | Different stresses in helical spring(circular) |
| 13 | 1st | Different stresses in helical spring(circular) |
| 2nd | Deflection of helical spring of circular wire |
| 3rd | Numerical on deflection of helical spring |
| 4th | Surge in spring and how to avoid it |
| 14 | 1st | Design of closed coil helical compression spring |
| 2nd | Design of closed coil helical compression spring |
| 3rd | Numericals on design of spring |
| 4th | Numericals on design of spring |
| 15 | 1st | Doubt clearing of all topics of subject |
| 2nd | Model question paper practice |
| 3rd | Model question paper practice |
| 4th | Closing of subject, course outcomes |

**TOTAL PERIODS: 60**

**NO. OF WEEKS : 15**