**USHA RAMA COLLEGE OF ENGINEERING AND TECHNOLOGY**

*Department of Mechanical Engineering*

**LESSON PLAN**

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| --- | --- |
| **Academic Year** : 2016-16 | **Sem**  : I |
| **Course**: **DESIGN OF MACHINE MEMBERS - I** | |
| **Class** : III B.TECH | **Section** : ME A&B |
| **Date of commencement of Class work** :13/06/2016 | **Date of end of Class work** : 08/10/2016 |
| **Prepared By**: K.shanthi, Assistant Professor | **Approved By**: HOD |

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| **Lecture**  **No** | **Date (As per Academic calendar)** | **Topics to be covered** | **Actual**  **Dateof completion** | **Remarks** |
| 1 | **13.6.16** | **INTRODUCTION:** General considerations design of Engineering Materials  design of Engineering Materials  design of Engineering Materials in the design of |  |  |
| 2 | **14.6.16** | Engineering Materials and their properties – selection |  |  |
| 3 | **15.6.16** | Manufacturing consideration in design, tolerances and fits –BIS codes of steels. |  |  |
| 4 | **16.6.16** | **STRESSES IN MACHINE MEMBERS:** Simple stresses – combined stresses – torsional |  |  |
| 5 | **17.6.16** | bending stresses- impact stresses-Problems |  |  |
| 6 | **18.6.16** | stress strain relation – various theories of failure- |  |  |
| 7 | **20.6.16** | various theories of failure-prob- factor of safety |  |  |
| 8 | **21.6.16** | design for strength and rigidity – preferred numbers |  |  |
| 9 | **22.6.16** | the concept of stiffness in tension, bending, |  |  |
| 10 | **23.6.16** | torsion and combined situations – |  |  |
| 11 | **24.6.16** | static strength design based on fracture toughness-prob |  |  |
| 12 | **25.6.16** | Problems on above topics |  |  |
| 13 | **27.6.16** | Problems on above topics |  |  |
| 14 | **28.6.16** | Problems on above topics |  |  |
| 15 | **29.6.16** | Problems on above topics |  |  |
| 16 | **30.6.16** | **STRENGTH OF MACHINE ELEMENTS:** Stress concentration – theoretical stress concentration factor . |  |  |
| 17 | **01.7.16** | fatigue stress concentration factor notch sensitivity |  |  |
| 18 | **02.7.16** | Prob on above topics |  |  |
| 19 | **04.07.16** | design for fluctuating stresses |  |  |
| 20 | **05.7.16** | endurance limit – estimationof endurance strength |  |  |
| 21 | **07.7.16** | Problems on above topics |  |  |
| 22 | **08.7.16** | Problems on above topics |  |  |
| 23 | **09.7.16** | goodman’s line – soderberg’s line |  |  |
| 24 | **11.7.16** | modified goodman’s line. |  |  |
| 25 | **12.7.16** | Problems on above topics |  |  |
| 26 | **13.7.16** | Problems on above topics |  |  |
| 27 | **14.7.16** | Problems on above topics |  |  |
| 28 | **15.7.16** | **Riveted and welded joints:** design of joints with initial stresses |  |  |
| 29 | **16.7.16** | design of joints -eccentric loading |  |  |
| 30 | **18.7.16** | Problems on above topics |  |  |
| 31 | **19.7.16** | Problems on above topics |  |  |
| 32 | **20.7.16** | design of joints -eccentric loading |  |  |
| 33 | **21.7.16** | Problems on above topics |  |  |
| 34 | **22.7.16** | Problems on above topics |  |  |
| 35 | **23.7.16** | **Bolted joints-** design of bolts with pre-stresses |  |  |
| 36 | **25.7.16** | Problems on above topics |  |  |
| 37 | **26.7.16** | design of joints under eccentric loading |  |  |
| 38 | **27.7.16** | Problems on above topics |  |  |
| 39 | **28.7.16** | Problems on above topics |  |  |
| 40 | **29.7.16** | locking devices – both of uniform strength, different seals. |  |  |
| 41 | **30.7.16** | Problems on above topics |  |  |
| 42 | **01.8.16** | Problems on above topics |  |  |
| 43 | **02.8.16** | Problems on above topics |  |  |
| 44 | **03.8.16** | Problems on above topics |  |  |
| 45 | **04.08.16** | Problems on above topics |  |  |
| 46 | **05.08.16** | Problems on above topics |  |  |
| 47 | **06.8.16** | Problems on above topics |  |  |
|  | **08.8.16 To13.8.16** | MID EXAMINATIONS-I |  |  |
| 48 | **16.8.16** | **KEYS, COTTERS AND KNUCKLE JOINTS:** Design of keys-stresses in keys |  |  |
| 49 | **17.8.16** | Problems on above topics |  |  |
| 50 | **18.8.16** | cotter joints-spigot and socket |  |  |
| 51 | **19.8.16** | Problems on above topics |  |  |
| 52 | **20.8.16** | Problems on above topics |  |  |
| 53 | **22.8.16** | sleeve and cotter, jib and cotter joints- knuckle joints. |  |  |
| 54 | **23.08.16** | Problems on above topics |  |  |
| 55 | **24.08.16** | Problems on above topics |  |  |
| 57 | **26.8.16** | Problems on above topics |  |  |
| 58 | **27.8.16** | **SHAFTS:**Design of solid and hollow shafts for strength and rigidity |  |  |
| 59 | **29.8.16** | Problems on above topics |  |  |
| 60 | **30.08.16** | Problems on above topics |  |  |
| 61 | **31.08.16** | design of shafts for combined bending and axial loads |  |  |
| 62 | **1.9.16** | Problems on above topics |  |  |
| 63 | **2.9.16** | Problems on above topics |  |  |
| 64 | **3.9.16** | shaft sizes – BIS code. Use of internal and external circlips, gaskets and seals (stationary & rotary). |  |  |
| 65 | **06.09.16** | Problems on above topics |  |  |
| 66 | **07.9.16** | Problems on above topics |  |  |
| 67 | **8.9.16** | Problems on above topics |  |  |
| 68 | **09.9.16** | **SHAFT COUPLING:** Rigid couplings – muff, split muff |  |  |
| 69 | **10.9.16** | Problems on above topics |  |  |
| 70 | **13.9.16** | Problems on above topics |  |  |
| 71 | **14.9.16** | Problems on above topics |  |  |
| 72 | **15.9.16** | flange couplings, flexible couplings |  |  |
| 73 | **16.9.16** | Problems on above topics |  |  |
| 74 | **17.9.16** | Problems on above topics |  |  |
| 75 | **19.9.16** | flange coupling (modified). |  |  |
| 76 | **20.9.16** | Problems on above topics |  |  |
| 77 | **21.9.16** | Problems on above topics |  |  |
| 78 | **22.9.16** | **MECHANICAL SPRINGS:** Stresses and deflections of helical springs |  |  |
| 79 | **23.9.16** | Problems on above topics |  |  |
| 80 | **24.9.16** | Problems on above topics |  |  |
| 81 | **26.9.16** | Problems on above topics |  |  |
| 82 | **27.9.16** | extension -compression springs – springs for fatigue loading |  |  |
| 83 | **28.9.16** | Problems on above topics |  |  |
| 84 | **01.10.16** | Problems on above topics |  |  |
| 85 | **03.10.16** | energy storage capacity – helical torsion springs |  |  |
| 86 | **04.10.16** | Problems on above topics |  |  |
| 87 | **05.10.16** | Problems on above topics |  |  |
| 88 | **06.10.16** | co-axial springs, leaf springs. |  |  |
| 89 | **07.10.16** | Problems on above topics |  |  |
| 90 | **08.10.16** | Problems on above topics |  |  |
|  | **10.10.16 To 15.10.16** | Mid Exams-II |  |  |

**TEXT BOOKS:**

1. Machine Design, V.Bandari, TMH Publishers
2. Machine design – Pandya & Shah
3. Machine Design PSG Data hand book

**REFERENCES:**

1. Design of Machine Elements / V.M. Faires
2. Machine design / Schaum Series.

**List the Course Outcomes (Cos):**

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| Sub code | Sub Name | COs | Expected level of attainment  On 5 scale |
|  | **DESIGN OF MACHINE MEMBERS - I** | 1. . Apply the design procedure to engineering problems, including the consideration of technical and manufacturing constraints  2. Select suitable materials and significance of tolerances and fits in critical design applications.  3 Utilize design data hand book and design the elements for strength, stiffness and fatigue.  4. . Identify the loads, the machine members subjected and calculate static and dynamic stresses to ensure safe design. | 3.5  3.5  3.5  3.5 |

**Signature of faculty Head of the Department**