**RJLB Govt. Polytechnic, Loharu**

***LECTURE PLAN (FEB.2024-JUNE. 2024)***

**BRANCH:** ME **SEMESTER: 4th** **SUBJECT:** MD

**NAME OF FACULTY**: RAVI KANT

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| **S.**  **No** | **Name of Topic** | **No. of Lect.** |
| **Chapter -1- Introduction** | | |
| 1 | **Design –** Definition, Type of design, necessity of design Comparison of designed and undesigned work, Design procedure, Characteristics of a good designer | 2 |
| 2 | **Design terminology:** stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, Endurance limit. General design consideration, Codes and Standards (BIS standards) | 4 |
| 3 | **Engineering materials and their mechanical properties:** Properties of engineering materials: elasticity, plasticity, malleability, ductility, toughness, hardness and resilience. Fatigue, creep, tenacity and strength etc. Selection of materials, criteria of material selection | 2 |
| **Chapter -2- Design Failure** | | |
| 4 | Various design failures-maximum stress theory, maximum strain theory | 2 |
| 5 | Classification of loads Design under tensile, compressive and torsional loads. | 2 |
| **Chapter -3- Design of Shaft** | | |
| 6 | Type of shaft, shaft materials, Type of loading on shaft, standard sizes of  shaft available | 2 |
| 7 | Shaft subjected to torsion only, determination of shaft diameter (hollow and solid  shaft) on the basis of :  - Strength criterion  - Rigidity criterion | 4 |
| 8 | Determination of shaft diameter (hollow and solid shaft) subjected to  bending | 2 |
| 9 | Determination of shaft diameter (hollow and solid shaft) subjected to combined  torsion and bending | 2 |
| **Chapter -4- Design of Key** | | |
| 10 | Types of key, materials of key, functions of key | 1 |
| 11 | Failure of key (by Shearing and Crushing). | 2 |
| 12 | Design of key (Determination of key dimension) | 2 |
| 13 | Effect of keyway on shaft strength. (Figures and problems). | 1 |
| **Chapter -5- Design of Joints** | | |
| 14 | **Types of joints -** Temporary and permanent joints, utility of various joints | 2 |
| 15 | **Temporary Joint**:  Knuckle Joints – Different parts of the joint, material used for the joint, type of knuckle Joint, design of the knuckle joint. (Figures and problems).  Cotter Joint – Different parts of the spigot and socket joints, Design of spigot and socket joint. | 8 |
| 16 | **Permanent Joint:**  Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds. Strength of combined parallel and transverse weld.  Riveted Joints. : Rivet materials, Rivet heads, leak proofing of  riveted joint – caulking and fullering. Different modes of rivet joint failure  Design of riveted joint – Lap and butt, single and multi rivetedjoint. | 10 |
| **Chapter -6- Design of Flange Coupling** | | |
| 17 | Necessity of a coupling, advantages of a coupling | 1 |
| 18 | Types of couplings | 2 |
| 19 | Design of muff coupling, | 2 |
| 20 | Design of flange coupling. (Both protected type and unprotected type). | 3 |
| **Chapter -7- Design of Screwed Joints** | | |
| 21 | Introduction, Advantages and Disadvantages of screw joints, location of screw joints. | 2 |
| 22 | Important terms used in screw threads, designation of screw threads | 2 |
| 23 | Initial stresses due to screw up forces, stresses due to combined forces | 2 |
| 24 | Design of power screws (Press, screw jack, screw clamp) | 2 |