

10 ME 412 DESIGN OF MACHINE ELEMENTS (SI UNITS)
IV B.Tech I Semester
(with effect from the academic year 2013-2014)

Lectures/week: 4 Hrs.
University Exam: 3 Hrs

Credits: 4
Sessional Marks: 40
End Examination Marks: 60

(Note: Use of Design data hand book is permitted during exam.)

UNIT-I

Keys and Couplings:

Keys- Introduction, Types of Keys; Design of sunk key. Effect of key way. Design of Splines. Couplings-Types of Shaft Couplings, Design of Sleeve or muff couplings, Clamp or Compression coupling, Flange Couplings. Design of Bushed pin type flexible coupling.

UNIT-II

Sliding Contact Bearings:

Classification of Bearings, Hydrodynamic lubricated bearings; Materials for sliding contact bearings; Lubricants – Properties and their selection Terminology used in Hydrodynamic journal bearings. Design procedure for journal bearings – Design of bearing caps and bolts. Heat in bearings.

Thrust Bearings: Design of footstep bearing and collar bearings.

UNIT-III

Rolling Contact Bearings:

Merits and demerits of rolling contact bearings over sliding contact bearings. Types of rolling contact bearings. Static and dynamic load capacities. Equivalent bearing load. Design for cyclic loads. Reliability of a bearing. Selection of radial ball bearings. Stribeck's equation.

UNIT-IV

Gears:

Types of gears and their applications, gear materials allowable stresses. Law of gearing. Spur gears: Terminology, force analysis, Design of spur gears – Lewis equation. Check for dynamic load and wear load. Gear wheel proportion. Helical Gears: Terminology, design of helical gears. Check for wear load. Force analysis. Bevel Gears: Terminology, Design of bevel gears.

UNIT-V

Engine parts:

Connecting rod: Thrust in Connecting rod – Stress due to whipping action on connecting rod ends; Cranks and Crank Shafts, Strength and proportions of overhang and center cranks; Pistons- forces acting on pistons , Constructional Design and proportions of Pistons.

TEXT BOOKS:

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| 1. Machine Design | : Khannaiah P |
| 2. Design of Machine Members | : Bandari V.B. |

REFERENCES:

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| 1. Mechanical Engineering Design | : Shigley J.E. |
| 2. Machine Design | : Pandya and Shah |
| 3. Machine Design | : Khurmi R.S |