

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Mechanical Engineering, VII-Semester

Departmental Elective ME- 702(D) Advance Machine Design

Course Objective

- Understand the design concepts of belt, rope and chain drives.
- Able to design different types of gears.
- Able to design I.C. Engine components, different types of couplings and power screw
- Inspect miscellaneous components such as flanged coupling, rigid coupling, and pressure vessels.

Course Contents:

Unit- I: Design of Belt, Rope and Chain Drives: Methods of power transmission, design of flat belt drive and V-belt drive ; Design of chain drives, roller chain and its selection; Design of rope drives.

Unit- II: Spur and Helical Gears: Force analysis of gear tooth, AGMA Bending stress equation and AGMA Contact stress equation, modes of failure, beam strength, Lewis equation, form factor, formative gear and virtual number of teeth; Gear materials; Surface strength and wear of teeth; strength against wear; Design of straight tooth spur and Helical Gears.

Unit- III: Bevel Gears: Application of bevel, formative gear and virtual number of teeth; Force analysis; Lewis equation for bevel gears; Strength against wear; Design of bevel gear.

Unit- IV: Design of I.C. Engine Components: General design considerations in I C engines; design of cylinder; design of piston and piston-rings; design of connecting rod; design of crankshaft.

Unit -V: Design of Miscellaneous Components: Design of Knuckle joint, Design of Cotter joint, Design of keys, Design of Flanged coupling; Rigid coupling and Flexible coupling ,Design of Pressure vessels subjected to internal pressure, Design of power screw.

References:

1. Shigley J.E.; Machine Design; TMH
2. Bhandari VB; Design of Machine Elements; TMH
3. Abdul Mubeen; Machine Design; Khanna Publishers
4. Sharma & Agrawal; Machine Design; Katson
4. Sharma CS and Purohit K; Design of Machine Elements; PHI Learning.
5. Dwivedi and Pandey; Machine Drawing and Design, Dhanpat Rai & Co.
6. Wentzell TH; Machine Design; Cengage Learning
7. Hall and Somani; Machine Design; Schaum Series; TMH
8. Kulkarni SG; Machine Design; TMH
9. Norton R; Design Of Machinery; TMH

Note: PSG Design data book and/ or Mahadevan and Reddy's Mechanical design data book are to be provided/ permitted in exam hall (duly verified by authority)

Evaluation: Evaluation will be continuous an integral part of the class as well through external assessment