



Machine Element Design 2

Course Code: 28654
Credits: 3
Course Type: Theoretical
Prerequisites: Machine Element Design1, Engineering Graphics 2
Course Length: 51 hours

Outline:

1. Journal Bearings:

Viscosity and its measurements, standards of lubricants, Petroff's model, stability of the oil film, 2D analysis of hydrodynamic bearings, 3D formulations, operation temperature, lubricant selection, materials of journal bearings, bearings with pressurized lubricant supply

2. Ball/roller bearing:

General construction, materials and tolerances, AFBMA standards, types of balls and roller materials, life calculations, load factors, static/dynamic load capacities, installation considerations, tolerances

3. Bendable power transmitters:

Mechanical types of power transmissions, belt drives, fundamental relations, flat belt, prestress, structures and applications of V-belts, operation factors, AVSi-Bo standards, design of pulleys, life estimation in belts, ribbed belts, cog belts, chain and sprocket, ISO and ANSI standards, technological considerations in fabrication of chains, timing belts

4. Gears:

Definitions, types of gears and applications, kinematics of gear meshing, involute curves, standards of gears, fabrication methods, interference, plain gears and fundamental relations, static strength, tooth strength, Hertz stress, gear materials, heat treatment, optimal dimensions, helical gears, advantages



and limitations, kinematics and dynamics relations, helical gears with parallel and unparallelled axes, worm gears, applications and fundamental design relations, conical gears

5. Breaks and Clutches:

Types of clutches, conical clutches, friction disk clutches and fundamental relations, belt clutches and brakes, self-locking in belt brakes, drum brakes and applications, centrifugal clutches and their applications/limitatins

References:

1. Mechanical Engineering Design, Shigley & Michel, Mc Grawhill Book Co. New York..
2. Machinery Handbook, 25th Edition, Industrial Press Inc.