RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Mechanical Engineering, V-Semester

Departmental Elective ME- 503 (B) Dynamics of Machine

Unit 1: Dynamics of Engine Mechanisms: Displacement, velocity and acceleration of piston; turning moment on crankshaft, turning moment diagram; fluctuation of crankshaft speed, analysis of flywheel.

Unit 2: Governor Mechanisms: Types of governors, characteristics of centrifugal governors, gravity and spring controlled centrifugal governors, hunting of centrifugal governors, inertia governors.

Unit 3: Balancing of Inertia Forces and Moments in Machines: Balancing of rotating masses, two plane balancing, determination of balancing masses (graphical and analytical methods), balancing of rotors, balancing of internal combustion engines (single cylinder engines, in-line engines, V-twin engines, radial engines, Lanchester technique of engine balancing.

Unit 4: Friction: Frictional torque in pivots and collars by uniform pressure and uniform wear rate criteria. Boundary and fluid film lubrication, friction in journal and thrust bearings, concept of friction circle and axis, rolling friction. Clutches: Single plate and multi plate clutches, Cone clutches.

Unit 5: Brakes: Band brake, block brakes, Internal and external shoe brakes, braking of vehicles. Dynamometer: Different types and their applications. Dynamic Analysis of Cams: Response of un-damped cam mechanism (analytical method), follower response analysis by phase-plane method, jump and cross-over shock.

References:
1. Ambekar, AG; Mechanism and Machine Theory; PHI
2. Rattan SS; Theory of machines; TMH
3. Sharma and Purohit; Design of Machine elements; PHI
4. Bevan; Theory of Machines;
5. Ghosh and Mallik; Theory of Mechanisms and Machines; Affiliated East-West Press, Delhi
6. Norton RL; kinematics and dynamics of machinery; TMH
7. Grover; Mechanical Vibrations
8. Balaney; Theory of Machines by
9. Theory of Vibrations by Thomson