RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Mechanical Engineering, IV-Semester

ME403 -THEORY OF MACHINES

[1] Introduction, kinematics and kinetics, mechanisms and machines, degree of freedom, types of motions, kinematic concept of links, basic terminology and definitions, joints and kinematic chains, inversions, absolute and relative motions, displacement, velocity and acceleration diagrams, different mechanisms and applications,

[2] kinematic synthesis of linkages, dynamic motion analysis of mechanisms and machines, D'Alembert's principle, number synthesis, free body diagrams, kinematic and dynamic quantities and their relationships, analytical method and graphical method

[3] Cams, introduction, classifications of cams and followers, nomenclature, analysis of cam and follower motion, analytical cam design with specific contours, pressure angle, radius and undercutting, motion constrains and program, critical path motion, torque on cam shaft

[4] Power transmission, kinematics of belt- pulley, flat and v –belt, rope, condition of maximum power transmission, efficiency, friction, friction devices, pivot and collars, power screw, plate and cone clutch, brakes, classifications, bock, band, internal and external, friction circle, friction axis,

[5] Gears, laws of gearing, classification and basic terminology, tooth profiles, kinematic considerations, types of gears, spur, bevel, worm, helical, hypoid etc, gear trains, epicyclic, compound,, balancing- static and dynamic, in same/ different planes, Introduction to vibration, single degree of freedom.

BOOKS:
[1] R.L.Norton,kinematics& dynamics of machinery,Tata McGraw Hill, ISBN13 978 0 07 014480 4
[2] A.Ghosh & A.Malik, Theory of Mechanisms and Machines,EWP Pvt Ltd,ISB 81 85095 72 8

Tutorials:
1.Displacement diagrams of slider crank and other linkages, analytical and graphical
2 Velocity diagrams and acceleration diagrams
3 Diagrams of cam and followers for different applications
4 Gears and gear trains transmission diagrams, analytical and graphical applications
5 Solutions to problems of industrial application using software