GUJARAT TECHNOLOGICAL UNIVERSITY
B.E   Semester: 4
Automobile Engineering

Subject Code   142001
Subject Name   KINEMATICS AND DYNAMICS OF MACHINES

Sr.No	Course content
1.	**SIMPLE MECHANISM:** Link, Kinematic chains and their classification, mechanism and machine, Inversions - four-bar chain and single slider crank chain, various types of quick return motions. Pantograph, straight line motion mechanisms.
2.	**MOTION ANALYSIS:** Angular and linear velocities in link mechanism, velocity and acceleration diagram for slider - crank chain and four-bar chain mechanism including coriolis component of acceleration. Analytical methods of Kinematic analysis.
3.	**FLEXIBLE POWER TRANSMISSION SYSTEM, GEOMETRICAL CONFIGURATION:** Analysis of forces and power transmission. Effects of centrifugal force, creep and initial tension.
4.	**GEARS:** Classification of gears, types of motion, law of gear tooth action, involute and cycloidal tooth profile - interference of gears - minimum number of teeth to avoid interference, contact ratio. Helical, spiral, worm and bevel gears, Introduction to gear train and types of trains.
5.	**GYROSCOPE:** Angular Velocity, Angular acceleration, Gyroscopic Torque, gyroscopic effect on naval ships,stability of automobile,stability of two wheel and four wheel automobile
6.	**CAMS:** Types of cams and followers. Drawing a cam profiles for a given displacement - time diagram, analysis of cam profiles with specified contours.
7.	**VIBRATIONS IN MECHANICAL SYSTEMS:** Introduction, Basic features of vibration systems - single degree of freedom systems and vibration isolation.
8.	**BALANCING:** Forces due to revolving masses. Balancing of revolving masses in one plane and in different planes.

Reference Books:

1. S.S.Rattan Theory of Machines   Tata Mc Graw Hill
2. Jagdish Lal   Theory of Machines   Metropolitan Book Co.
3. Amitabha Ghosh & Mallik A. K. Theory of Mechanisms and Machines East West Press
4. Rao J. S. and Dukkipati R. V. Mechanism & Machine Theory   New Age International Pub.
5. Charles E. Wilson & J.Peter Sadler Kinematics and Dynamics of Machinery Pearson Education publications