GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - MECHANICAL ENGINEERING
SEMESTER: V

Subject Name: **Theory of Machine**
Subject Code: **X51901**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (Internal)**
3	0	2	5	70	30	50

Sr. No.	Course content
1	**Brakes and Dynamometers:** Introduction, Brakes classification, Mechanical Brakes-Shoe brake, Band brake, Band and block brake, Internal expanding shoe brake, Braking of vehicle, Dynamometer, Absorption and transmission type.
2	**Governors:** Introduction, Function and types of governors, Centrifugal governors, Watt governor, Porter governor, Proell governor, Hartnell governor, characteristics of governor- stability, Sensitivity, isochronism, Hunting controlling forces and stability, Effort and power of governor, Inertia governor.
3	**Gyroscope:** Concept of gyroscope, Angular acceleration, Gyroscopic effects in ships, Airplanes, Stability of two wheeled vehicle, Stability of automobile negotiating a curve, Gyroscopic analysis of inclined rotating discs.
4	**Flywheel:** Function, construction, Flywheel's rim and dimensions, Operation of flywheel in a punching machine, Turning moment diagram, Fluctuation of energy and fluctuation of speed of crank shaft, Coefficient of fluctuation of energy and speed.
5	**Inertia forces in reciprocating parts:** Introduction, D –Alberts's Principle, Effect of number of forces on a rigid, Velocity and acceleration of the piston, Forces on the reciprocating parts of an engine considering friction and inertia of moving parts- piston effort, force acting along connecting rod, Thrust on sides of cylinder walls, Crank effort, Thrust on crank shaft, Dynamically equivalent systems, Compound pendulum, Bifilar suspension, Trifilar suspension, Klein's construction.
6	**Synthesis of linkages:** Kinematic synthesis, Function generation, Path generation, Motion generation, Graphical synthesis, Precision positions, Structural error and chebychev spacing.

Term Work:

The term work shall be based on the topics mentioned above.

Practical / Oral:

The candidate shall be examined on the basis of term-work.

Reference Books:

1. Theory of Machines by S.S. Rattan. , Tata McGraw Hill.
2. Theory of Machines by Dr. Sadhu Singh Pearson Education.
3. Theory of Machines and Mechanisms by J.Uicker , Gordon R Penstock & J.E. Shigley Oxford International Edition.
4. Kinematics, Dynamics and Design of Machinery by Kenneth J Waldron , Gary L Kinzel Wiley Edition.
5. Dynamics of Machinery by Farazdak Haideri , Nirali Publication.
6. Theory of Machines by R.S.Khurmi S.Chand.