MEE311 Theory of Machines-I (3+0+0 3 Units)

Fundamental concept in kinematics and motion, Mechanism, Instantaneous Center: Forces and motion relationships in constrained mechanisms. Relative velocity and accelerations in mechanisms, analysis of cam and followers, gear, linkage, belt drive and chain drive systems for motion and power transmission. Vehicular mechanism: brake and clutch systems. Velocity and acceleration diagrams of mechanisms, tongue diagrams; fluctuations of energy and speed. Introduction to analytical methods and computation in analysis of mechanism. Static and inertia force analysis in machine. Static and Dynamic equivalent systems. Kinetics and balancing of rotating and reciprocating masses and the balancing of their out-of-balance forces. Flywheel, Governors, Gyroscope motion and forces. Power transmission, belts, coupling; gearing between parallel shafts, epicycle gearing. Friction clutches; Cone and plate tubes. Friction in machines (bearing, clutches, etc), Free and forced vibration. Critical speeds, whiling of shaft, vibration isolation, transmissi