

1.	Title of the course	Kinematics and Dynamics of Machinery
2.	Course number	ME205M
3.	Structure of credits	2-1-2-4
4.	Offered to	UG
5.	New course/modification to	Modification To ME2206/8
6.	To be offered by	Department of Mechanical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	Course Objective(s): This course deals with the kinematics and rigid-body dynamics of machine components. Motion and force analysis of planar linkages will be discussed. Kinematic analysis of cams, gears and gear trains will be discussed. Force analysis of gyroscopes, flywheel and vibration systems will be introduced.	
10.	Course Content: Introduction to linkages, kinematic pairs, chains, mobility, kinematic inversion; Kinematic analysis, graphical velocity and acceleration, analytical velocity, acceleration, instantaneous centres; Force analysis using analytical approach; Synthesis of linkages; Balancing, single & two plane balancing, inline and v multi-cylinder balancing; Flywheel, gyroscopes, gear kinematics, theory of gearing, velocity ratio of gear trains; cam and follower systems; Laboratory: Mass moment of inertia, Coriolis component of force, measurement of centrifugal force, measurement of gyroscopic moment, dynamics of spur gear train, dynamics of planetary gear train, forces on IC engines, cam-follower kinematics	
11.	Textbook(s): 1. Ghosh A and Mallik A K, <i>Theory of Mechanisms and Machines</i> , 3rd Edition, East West Press (2015). 2. Norton R L, <i>Kinematics and Dynamics of Machinery</i> , 1st Edition, McGrawHill (2009).	
12.	Reference(s): 1. Uicker J J, Pennock G R and Shigley J E, <i>Theory of Machines and Mechanisms</i> , 4th Edition, McGrawHill (2010).	