

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VI Mechanical Engineering

Subject Name: **Dynamics of Machinery**

Subject Code: **161901**

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

Sr. No	Course Content	Total Hrs.
1.	Balancing: Need for balancing, Static balance, balancing of rotating masses in same and different planes, Numericals	03
	1.1 Dynamic balancing, balancing of reciprocating masses, Numericals	03
	1.2 Balancing of locomotives, Partial balancing of locomotives, swaying couple, hammer blow, variation in tractive effort,. Numericals	03
	1.3 Balancing of multi cylinder in line engines, direct and reverse crank concept, Numericals	03
	1.4 Balancing of V and radial engines, Numericals ,balancing machines	04
2.	Mechanical Vibrations: -Introduction, Degree of freedom, Types of vibrations, uses effects and remedy; free natural vibrations, Newton method and energy method for single degree of freedom.	03
	2.1 Damped vibrations; under damped, critically damped and over damped systems, response curves for single degree of freedom system. Numericals	04
	2.2 Forced vibrations with and without damping in single degree of freedom, rotating and reciprocating unbalance, base excitations, Numericals	04

	2.3 Vibration Isolation and transmissibility; Force transmissibility, Motion transmissibility. Forced vibration with rotating and reciprocating Unbalance. Materials used in vibration isolation, Numericals	03
	2.4 Longitudinal and Transverse Vibrations, whirling of shaft with a single disc with and without damping, Dunkerley's method for simply supported beams.	03
	2.5 Torsional vibrations, torsionally equivalent system, stepped shafts and tapered shafts, two rotor, three rotor and geared systems, Numericals	03
	2.6 Stodola's and Holzer's method for multi rotor systems, Numericals	02
	2.7 Two degree and Multi degree Vibrations, wave equation, boundary conditions in beams, solution of wave equation, Rayleigh's method, Numericals	03
	2.8 Vibration measuring instruments, vibrometer, accelerometer and frequency measuring instruments	04

Text Books:

1. Mechanical Vibrations By Shrikant Bhawe, Pearson Publication
2. Theory Of Machines by S.S.Rattan , Tata Mc-Graw Hill
3. Theory Of Machines & Mechanisms by P.L.Ballaney , Khanna Publishers, Delhi
4. Mechanical Vibrations by G.K.Groover & A.K.Nigam, Nemchand Bros., Roorkee

Reference Books:

1. Theory Of Machines And Mechanisms by J.E.Shigley, Tata Mcgraw Hill
2. Dynamics Of Machines by F. Haidery , Nirali Prakashan, Pune
3. Theory Of Machines by V.P.Singh, Dhanpatrai Pub., Delhi
4. Mechanical Vibration by Schaum Series, Mc-Graw Hill