GANPAT UNIVERSITY
B. TECH. SEM. V – MECHANICAL ENGINEERING
ME-503 VIBRATION & BALANCING OF MACHINES

Teaching scheme (Hrs)			Examination scheme (Marks)							
			Theory				Practical			Grand total
L	P	Total	Int Asses	Sem end		Total	Int Asses	Sem End	Total	
				Marks	Marks					
3	2	5	30	70	3	100	25	25	50	150

1. **Balancing:-**
   Introduction, Balancing of single revolving mass, Balancing of several masses revolving in the same plane, Several masses revolving in different planes, Static & Dynamic balancing, Balancing of Reciprocating mass, Partial primary balancing of locomotives, Variation of tractive force, Swaying couple, Hammer blow, Coupled locomotives, Balancing of multi cylinder inline engine, Balancing of V engine, Balancing of Radial engine, Direct and Reverse crank method of balancing, Balancing machine.

2. **Cam Dynamics: -**
   Tangent cam, Circular disc cam, Cylindrical cam, Conical cams, Analytical and Graphical methods for determination of velocity and accelerations, Dynamics of high speed cam systems, Polydyne cams, Force analysis of cams, Vibrations in cam, Jump in cam, Shock in cam, Spring surge criteria in high speed cams, Synthesis of cam.

3. **Vibration: -**
   Introduction, Types of vibrations, Natural, Damped & Undamped vibration, Forced vibration, Energy method, Rayleigh's method, Differitial equation of damped free vibration, Logarithmic decrement, Forced vibrations, Characteristic curves, Single degree & multi degree system vibration, Transverse vibration, Vibration isolation, Torsional vibrations, Equivalent torsional systems with gears, Critical speed of shafts, Critical speed of disc, Critical speed with damping, Introduction to Non linear vibrations, Vibration Measuring Instruments.

- **Term work: -**
  The term work shall be based on experimental and analytical work on topics mentioned above

- **Practical & Oral: -**
  The candidate shall be examined orally / practically on the base of above term work.

- **Reference Books**

1. Theory of machines — By V.P. Singh, Dhanpat Rai & Son's
2. Theory of machines — By S.S. Ratan, Magraw-Hill public
3. Theory of machines — By Haidari
4. Mechanisms of Machine — By rao & Dukkipatti
5. Theory of machines — By Sadhu singh
6. Theory of machines — By P.L. Bellani
7. Mechanical vibrations — By G.K groover
8. Theory of machine & mechanisms — By Joseph Sigly
9. Vibration & noise for Engineer — By Kaiwal Pujara
10. Mechanical vibration — By setc
11. Theory & practice of mechanical vibration — By Rao & Gupta