**ME6505 DYNAMICS OF MACHINES**

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**UNIT I FORCE ANALYSIS 9**

Dynamic force analysis – Inertia force and Inertia torque– D Alembert’s principle –Dynamic Analysis in reciprocating engines – Gas forces – Inertia effect of connecting rod– Bearing loads – Crank shaft torque – Turning moment diagrams –Fly Wheels – Flywheels of punching presses- Dynamics of Cam follower mechanism.

**UNIT II BALANCING 9**

Static and dynamic balancing – Balancing of rotating masses – Balancing a single cylinder engine – Balancing of Multi-cylinder inline, V-engines – Partial balancing in engines – Balancing of linkages – Balancing machines-Field balancing of discs and rotors

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**UNIT III SINGLE DEGREE FREE VIBRATION 9**

Basic features of vibratory systems – Degrees of freedom – single degree of freedom – Free vibration – Equations of motion – Natural frequency – Types of Damping – Damped vibration– Torsional vibration of shaft – Critical speeds of shafts – Torsional vibration – Two and three rotor torsional systems.

**UNIT IV FORCED VIBRATION 9**

Response of one degree freedom systems to periodic forcing – Harmonic disturbances –Disturbance caused by unbalance – Support motion –transmissibility – Vibration isolation vibration measurement.

**UNIT V MECHANISM FOR CONTROL 9**

Governors – Types – Centrifugal governors – Gravity controlled and spring controlled centrifugal governors – Characteristics – Effect of friction – Controlling force curves. Gyroscopes –Gyroscopic forces and torques – Gyroscopic stabilization – Gyroscopic effects in Automobiles, ships and airplanes.

**TOTAL : 45 PERIODS**

**TEXT BOOK:**

1. Uicker, J.J., Pennock G.R and Shigley, J.E., “Theory of Machines and Mechanisms” ,3rd

Edition, Oxford University Press, 2009.

2. Rattan, S.S, “Theory of Machines”, 3rd Edition, Tata McGraw-Hill, 2009