Gautam Buddha University, Greater Noida

School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
Integrated B. Tech. + M. Tech. / M.B.A.	Dynamics of Machines	ME 204	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
IV	4	3-1-0	3 Hours

Unit – I

Friction: Types of friction; Coefficient of friction; Inclined plane; Friction of screw and nuts; Pivot and collar; Wedges; Uniform pressure and wear; Friction circle and friction axis - lubricated surfaces; Friction clutches - single disc or plate clutch; Multiple disc clutch; Cone and centrifugal clutch.

Precession: Introduction of the machine dynamics; Gyroscopic couple; Effect of precession motion on the stability of moving vehicles - motor car; Aero planes and ships; Stability of four-wheeler and two-wheelers moving on curved path.

(10 Hours)

Unit – II

Brakes and Dynamometers: Single block brakes; Pivoted block brake; Internal expanding brake; Band brake of vehicle; Raking of vehicle; Absorption Dynamometers; Transmission dynamometers - General description and method of operation. **(06 Hours)**

Unit – III

Turning Moment Diagram and Flywheels: Turning moment diagram for two-stroke and four-stroke engine; Fluctuation of energy; Fly wheels; Coefficient of fluctuation of speed; Energy stored in flywheel; Dimensions of flywheel rim and their design. **(07 Hours)**

Unit – IV

Governors: Centrifugal governors **-** Watt governor; Porter governor; Proell governor; Spring loaded governors - Hartnell governor; Hartung governor with auxiliary springs; Properties of governors - Sensitiveness; Isochronisms and Hunting. **(08 Hours)**

Unit – V

Balancing of Rotating Masses: Balancing of single mass rotating in same plane and different planes; Balancing of several masses rotating in same plane; Balancing of multiple masses rotating in different planes. **(07 Hours)**

Unit – VI

Balancing of Reciprocating Masses: Primary; Secondary; and higher balancing of reciprocating masses; Unbalanced forces and couples; Examination of multi cylinder in line and radial engines for primary and secondary balancing; Locomotive balancing – Hammer blow; Swaying couple; Balancing of radial and V-engines. **(07 Hours)**

Recommended Books:

1. Theory of Mechanisms and Machines: Amitabha Ghosh and Ashok Kumar Malik; Third Edition Affiliated East-West Press.
2. Theory of Machines and Mechanisms: Joseph Edward Shigley and John Joseph Uicker; Jr. Second Edition; McGraw Hill.
3. Theory of Machines; Thomas Bevan; 3rd Ed.; CBS Publishers.
4. Theory of Machines; Jagdish Lal.
5. Theory and Machines: S.S. Rattan; Tata McGraw Hill.
6. Mechanism and Machine Theory: J. S. Rao and R.V. Dukkipati Second Edition New age International.
7. Kinematics and Dynamics of Machines; Martin; G. H.; 3rd Ed.; McGraw Hill.
8. Mechanics of Machines: Elementary Theory and Examples; J. Hannah and R. C. Stephens; 4th Ed.; Viva Books.