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.	Machine Design - I	ME 303	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
V	4	3-1-0	3 Hours

Unit - I

Introduction: Introduction to engineering design; Machine design; Design procedure and considerations; Use of standards in design; Preferred numbers; Factor of safety; Free body diagram; Various types of stresses; 2D and 3D stress elements; Static failure theories; Design for rigidity and stiffness. **(09 Hours)**

Unit - II

Material Selection: Classification of materials; Ductile and brittle materials; Stress-strain diagrams of some common materials; Various properties of materials; Designation of materials; Criterion for material selection.

(04 Hours)

Unit –III

Design of Elements Subjected to Simple Loadings: Levers; Screws including power screws; Screw jack; Bolted joints; Riveted joints and welded joints including eccentrically loaded joints. **(10 Hours)**

Unit –IV

Joints and Couplings: Cotter joint; Knuckle joint; Pipe joints; Keys and couplings. **(10 Hours)**

Unit - V

Design for Fatigue Loading: Fatigue loads; Stress concentration; Sensitivity; Endurance strength/limit and modifying factors; Surface strength; Soderberg criterion; Goodman criterion; Modified Goodman criterion. **(08 Hours)**

Unit - VI

Shafts and Axles: Shaft and axle design; Procedure of shaft design with static and cyclic loadings. **(04 Hours)**

Recommended Books:

1. Fundamentals of Machine Elements; B. J. Hamrock; B. Jacobson; S. R. Schmid; McGraw Hill.
2. Machine Design; Joseph E. Shigley Tata McGraw Hill.
3. Design of Machine Elements; V.B. Bhandari; Tata McGraw Hill.
4. Machine Design – Fundamentals and Applications; P. C. Gope; PHI learning Pvt. Ltd.
5. Machine Design; P.C. Sharma & D.K. Aggarwal; Katson.
6. Machine Design; Khurmi & Gupta ; S. Chand.
7. Machine Design; Juvinal; Jhon-Wiley Publications
8. Machine Design; Spots; Prentice Hall Publications
9. Machine Design: An Integrated Approach; R. L. Norton; Pearson Education
10. Machine Design; Pandaya and Shah; Charotar Publications
11. Machine Design; R. K. Jain; Khanna Publications.