

Gautam Buddha University, Greater Noida
School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
M. Tech.	Machine Tool Design	MEM 516	SM+MT+ET 25+25+50
Semester	Credits	L-T-P	Exam.
II	3	3-0-0	3 Hours

Unit – I

Machine Tool Drive: Classification of Machine Tools; General purpose; Special purpose; Automatic; Semi-Automatic machine tools; Transfer lines; Working and auxiliary motion in machine; Machine tool drives; Hydraulic transmission; Mechanical transmission; General requirements of machine tool; Layout of machine tools. **(06 Hours)**

Unit – II

Regulation of Speed and Feed Rates: Aim of speed feed regulation; Stepped regulation of speed; Design of speed box; Design of feed box; Special cases of gear box design; Set stopped regulation of speed and feed rates **(07 Hours)**

Unit – III

Design of Machine Tool Structure: Fundamentals of machine tool structures and their requirements; Design criterion of machine tool structures; Static and dynamic stiffness; Design of beds and columns; Design of housing models; Techniques in design of machine tool structure **(08 Hours)**

Unit – IV

Design of Guide-ways and Power Screws: Function and type of guide-ways; Design of slide-ways; Protecting devices for slide-ways; Design of power screws. **(08 Hours)**

Unit – V

Design of Spindles and Spindle Supports: Materials for spindles; Design of spindles; Antifriction bearings; Sliding bearings. **(08 Hours)**

Unit – VI

Dynamics of Machines Tools: General procedure of assessing dynamic stability of EES; Cutting processing; Closed loop system; Dynamic characteristics of cutting process; Stability analysis. **(08 Hours)**

Books recommended:

1. Machine Tool Design and Numerical Control; N.K. Mehta; Tata McGraw Hill, 2002.
2. Machine Tool Design Handbook; CMTI Bangalore, 2004.
3. Machine Tool Design; N. Acherkan; V. Push; University Press of the Pacific; 2000.
4. Machine Tool Design (Vol. 1; 2 & 3); Acharkan; MIR Publishers; Moscow; 1973.
5. Principles of Machine Tools; Sen and Bhattacharya; New Central Book Agency; Calcutta; 1975.
6. Design of Machine Tools; S. K. Basu; Allied Publishers; India; 1961.