



INSTRUCTION DIVISION
SECOND SEMESTER 2016-2017
Course Handout Part II

Date: 28-11-2019

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **MF F341**
Course Title : **DESIGN OF MACHINE TOOLS**
Instructor-in-Charge : **Dr. Ravi Shanker Vidyarthi**

Scope and Objective of the Course: The Course is intended to focus the student's attention on the concepts of design, analysis and features of different types of machine Tools, different machine elements to make a machine tool and new concepts in machine tool engineering. The course covers introduction to machine tool drives and mechanisms - general principles of machine tool design, regulation of speed and feed rates, design of machine tool structures, design of guideways and power screws, design of spindles and spindle supports, dynamics of machine tools, control systems in machine tools

The students are encouraged to select seminar topics of current interest and developments in the fields of technology of construction of Machine Tools and present them in the class apart from the regular classroom learning.

Textbooks:

1. N.K. Mehta," *Machine Tool Design and Numerical Control*", second Edition, Tata McGraw Hill book Company, (2011) [1]

Reference books

1. S. K. Basu, and D. K. Pal, "*Design of Machine Tools*", Oxford & IBH Publication Co Pvt Ltd, New Delhi (1995) [2]
2. A.B. Chattopadhyay, "*Machining and Machine Tools*" Wiley-India (2011) [3]

Course Plan:

Lec. No.	Learning objectives	Topics to be covered	Ref. [book]-Ch.
1	Enable the student to, classify MT*, select the mechanisms, evaluate the machining time, forces and power requirement of a MT	Fundamentals of Machine Tool Design, Design Considerations, General requirements	[1]-1, [3]-1,2
2-4		Determination of machining forces and power in turning, milling, grinding, drilling and shaper.	[2]-2
5-8	Student will be able to classify and design different types of guide ways, beds, tables and columns	Design of machine tool guide ways, beds, tables and columns	[1]-3, [2]-6,7
9-11	Student will be able to design a power screw spindle for a MT	Design of power screws, and spindle units	[1]-4, [2]-8, 9



12-14	Student will be able to design spindle and bearings	Bearings and lubrication in machine tools	[1]-5, [2]-10
15-18	Enable the student explain the working of electric and hydraulic systems of a MT	Electric and hydraulic systems of machine tools	[1]-1, [2]-12, 13
19-24	Student will be able to identify and evaluate the different dynamic effects of a MT	Dynamics of Machine Tools, Vibrations and dynamic rigidity	[1]-6, [2]-16, 23
25-26	Student will be able to explain the micro displacement systems and some importance design features of SNS machine	Micro-displacement in machine tools, Design of CNC machines	[2]-17, Class Notes
27-33	Student will be able to, select, design & differentiate the effects the different speed steps of a MT.	Kinematics of machine tools and design of gearboxes, step-less regulation	[1]-1,2, [2]-3,4
34-39	Student will be able to explain the working of different types of speed and feed box	Types of speed and feed box	[1]- 2

***MT: Machine Tool**

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid Sem. Test	1 Hr 30 min	25		CB**
Tutorial	--	10		OB
Quiz	--	15		--
Project	--	10		OB
Comprehensive Examination	3 Hrs	40		Partial OB(at least 10%) and CB

**** CB = Closed book, OB = Open Book**

Chamber Consultation Hour: To be decided based on Timetable.

Notices: All notices will be put up on CMS only.

Make-up Policy: Make-up will be given with prior concern and genuine reasons only.

INSTRUCTOR-IN-CHARGE

