Course code	Course Name	L-T-P-Credits	Year of Introduction
MP212	MACHINE TOOLS	3-1-0-4	2016

Prerequisite : Nil

Course Objective

To impart knowledge on basic concepts of various machining processes and machine tools

Syllabus

Basic working principle, configuration, specification and classification of machine tools like lathe, shaping, planing and slotting machine, drilling machine, milling machine and broaching. Abrasive machining process, study of different types of work holding and tool holding devices. Estimation of machining time

Expected Outcome

At the end of the course, the student will be able to:

i. understand working of various Machine Tools
ii. understand speed and feed mechanisms of machine tools.
iii. estimate machining times for machining operations on machine tools

Text books

1. S. K. Hajra Chowdary , A. K. Hajra Chowdary and Nirjhar Roy, "*Elements of Workshop Technology"*, Vol. II, Media Promoters& publishers pvt. Ltd., Mumbay.
2. R.K. Jain, "*Production Technology*", Khanna Publishers, New Delhi.

References

1. HMT Bangalore, "*Production Technology*", Tata Mc-Graw Hill Education.
2. O. P. Khanna, "*Production Technology"*, Dhanpath Rai Publications, New Delhi.
3. Chapman W. A. J., *"Workshop Technology*", Vol: III, ELBS, London
4. Richard R. Kibbe, "*Machine Tool Practices"*, Pearson education
5. ASM Handbook, *"Machining"*

Course Plan

Module	Contents	Hours	Sem. exam marks
I	Elements of M/C Tools, M/C Tool drives, Classification of Machine Tools Lathe: Classification, Parts, Feed Mechanisms, Specifications of lathe, Lathe Operations, Accessories and Attachments, metal removal rate and machining time estimation	10	15%

II	Shaper and Planer: Types, Specifications, Shaper Vs Planer. Drilling and allied operations: Introduction, Types of Drilling machines and Drills, Drilling machine, Boring, Reaming and other operations, Types of Boring machines. Marching time estimation of drilling	8	15%
First Internal Exam			
III	Milling: Types of milling machines and milling cutters, Milling Operations, Machining time estimation, Dividing head and Indexing	10	15%
IV	Broaching: Principle of operation, Types and Specifications of broaching machine, broaching tools, operations, broaching fixtures.	8	15%
Second Internal Exam			
V	Grinding: Grinding machines, types - surface, cylindrical, internal and center-less grinder, Grinding wheel, Specification and selection of grinding wheels, Cutting speed and feeds, Dressing and Truing.	10	20%
VI	Finishing processes: Introduction, Types of finishing operations lapping, honing, super finishing and burnishing, operating parameters, accuracy, surface finish attainable by various processes. Gear Manufacturing: Gear shaping, gear hobbing, gear shaving, gear grinding, gear lapping	10	20%
End Semester Exam			

Question Paper Pattern

Total marks: 100, Time: 3 hrs

The question paper should consist of three parts

Part A

4 questions uniformly covering modules I and II. Each question carries 10 marks

Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part B

4 questions uniformly covering modules III and IV. Each question carries 10 marks

Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part C

6 questions uniformly covering modules V and VI. Each question carries 10 marks

Students will have to answer any four questions out of 6 (4X10 marks =40 marks)

Note: In all parts, each question can have a maximum of four sub questions, if needed.