



# SILVER OAK UNIVERSITY

College of Technology (01)

Diploma in Mechanical Engineering

Subject Name: Manufacturing Technology-I

Subject Code: 1010122216

Semester: 3<sup>rd</sup>

**Prerequisite:** Workshop Practice

**Objective:** To understand the working of different machine tools and its different applications.

**Teaching and Examination Scheme:**

Teaching Scheme					Evaluation Scheme				Total Marks
L	T	P	Contact hours	Credits	Theoretical		Practical		
					CIE (TH)	ESE (TH)	CIE (PR)	ESE (PR)	
3	0	2	5	4	40	60	20	30	150

**Content:**

Unit No.	Contents	Teaching Hours	Weightage %
1	<b>Basic Machine Tools and Metal Cutting Principles:</b> Introduction to Manufacturing Technology, Various Workshop Layouts, Machine tools classification, working and auxiliary motions in machine tools, Primary cutting motions in machines tools, need of metal cutting, metal cutting principles, cutting tool geometry and tool signature.	6	8%
2	<b>Lathes Machine:</b> Engine Lathes, Construction of Lathe Components, types of engine lathes, Operations on engine lathe, attachment extending the processing capacities of engine lathes, Types of lathe machines, Capstan and Turret lathes, Taper turning on lathe, Thread cutting on lathe using gear train and chasing dial, Alignment test of lathes, Advancements in Lathe Machines and its real applications.	*	25%
3	<b>Milling Machines:</b> Purpose and types of milling machines, general purpose milling machines, different types of milling operations, milling cutters, attachments extending the processing capabilities of general-purpose milling machines, different types of Indexing method, Helical milling operation and its set up, Alignment tests of milling machine.	14	20%

4	<p><b>Drilling Machines:</b> Purpose and field of application of drilling machines, Types of drilling machines, Drilling and allied operation: drilling, boring, reaming, tapping, counter sinking, counter boring, spot facing; deep hole drilling, alignment tests of drilling machine.</p> <p><b>Boring Machine:</b> Purpose and filed of application, Horizontal boring machines, Precision boring machines.</p>	12	15%
5	<p><b>Planers, Shapers and Slotters:</b> Classification of planers, Shapers and Slotters, Attachments extending the processing capacities of planers, Shapers and Slotters, machine and tooling requirements.</p>	*	10%
6	<p><b>Sawing and Broaching Machines:</b> Metal sawing classification: reciprocating sawing machines, circular sawing machines, band sawing machines, Types of broaching machines, advantage and limitations of broaching, advantage and limitations of broaching.</p>	6	7%
7	<p><b>Grinding Machines and Abrasives:</b> Classification of grinding machines, cylindrical grinders, internal grinders, Surface grinders, tool and cutter grinders, center less grinders, Types of grinding wheels, wheel characteristics and wheel selection.</p>	*	7%
8	<p><b>Jigs and Fixtures:</b> Definition, Differences between Jigs and Fixtures, design principles, 3-2-1 location principle and its application, types of locators, concept of work piece control, geometric control, dimensional control and mechanical control, Clamps, jig bushes, Jigs and fixtures for various machining operations.</p>	6	8%

**\*Note: Unit No. 2, 5 and 7 of the above Syllabus are to be covered in Practical Hours.**

**Course Outcome:**

Sr. No.	CO statement	Unit No
CO-1	Understand the basic concept of machining process.	1
CO-2	Ability to use different machining and its machining parameters.	2,3,4,5,6,7
CO-3	Analyze any conventional machining processes.	2,3,4,5,6,7
CO-4	Analyze the relevance of manufacturing techniques and real life application in industry.	2,3,4,5,6,7

## **Teaching & Learning Methodology:**

1. Direct instruction
2. Kinesthetic learning
3. PPT and Video Animations
4. Flipped classroom
5. Case Study / Open Ended Problem
6. Industrial Visit

## **List of Experiments:**

1. Study of Machine Tools (Lathe, Shaper, Slotter, Planner).
2. Study of Machine Tools (Grinding, Milling, Drilling)
3. Job making on Lathe machine
4. Job making on Milling machine
5. Job making on Drilling machine
6. Job making on Shaper/Slotter machine
7. Job making on Grinding machine
8. Alignments test on lathe machine/any other machine.

## **Major Equipment:**

1. Lathe Machine
2. Milling Machine
3. Shaper Machine
4. Slotter Machine
5. Drilling machine
6. Grinding Machine

## **Books Recommended:**

1. Workshop Technology Vol. I, II & III, WAJ Chapman.
2. Workshop Technology Vol. II, Hajira & Choudhari.
3. Manufacturing Processes, O.P.Khanna.
4. Production Technology, R. K.Jain.
5. Processes and Materials of Manufacture; Lindberg Roy A.; Prentice-HallIndia.
6. Principles of Manufacturing Materials and Process, J SCampbell.

## **List of Open Source Software/learning website:**

1. <https://nptel.ac.in/courses/112/105/112105233/>
2. <https://nptel.ac.in/courses/112/105/112105126/>
3. <https://nptel.ac.in/courses/112/105/112105306/>