

**Lesson Plan**

Name of the Faculty : Mr. Pardeep  
Discipline : Mechanical Engineering  
Semester : 5<sup>th</sup>  
Subject : Manufacturing Technology-1 (PCC-ME- 305G)  
Lesson Plan Duration : 15 Weeks (from Aug. 2020 to Nov. 2020)  
\*\* Work Load (Lecture) per week (in hours): Lectures-02, Practicals-00

Week	Theory		Practical	
	Lecture Day	Topic (including assignment/test)	Practical day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	Metal Cutting & Tool Life: Introduction, basic tool geometry.		No Practical
	2 <sup>nd</sup>	Single point tool nomenclature, chips types and their characteristics.		
2 <sup>nd</sup>	3 <sup>rd</sup>	Mechanics of chips formation, theoretical and experimental determination of shear angle.		
	4 <sup>th</sup>	Orthogonal and oblique metal cutting, metal cutting theories, relationship of velocity, forces, and power consumption.		
3 <sup>rd</sup>	5 <sup>th</sup>	Cutting speed, feed and depth of cut, coolant, temperature profile in cutting.		
	6 <sup>th</sup>	Tool life relationship, Taylor equation of tool life, tool material and Mechanism.		

4 <sup>th</sup>	7 <sup>th</sup>	Economics of Metal Machining: Introduction, elements of machining cost.		
	8 <sup>th</sup>	Tooling economics, machining, economics and optimization.		
5 <sup>th</sup>	9 <sup>th</sup>	Geometry of twist, drills and power calculation in drills.		
	10 <sup>th</sup>	Metal forming Jigs and Fixtures: Introduction, Metal blow condition, theories of plasticity.		
6 <sup>th</sup>	11 <sup>th</sup>	Conditions of plane strains, friction, conditions in metal working.		
	12 <sup>th</sup>	Wire drawing, theory of forging, rolling theory, no slip angle, and foreword slip.		
7 <sup>th</sup>	13 <sup>th</sup>	Types of tools, principles of locations, locating and clamping devices, jigs bushes, drilling jigs, milling fixtures, turning fixtures.		
	14 <sup>th</sup>	Boring and broaching fixtures, welding fixtures, different materials, for jigs and fixtures		
8 <sup>th</sup>	15 <sup>th</sup>	Economics of jigs and fixtures.		
	16 <sup>th</sup>	Metrology: Measurement, linear and angular simple measuring instruments.		

9 <sup>th</sup>	17 <sup>th</sup>	Various clampers, screw gauge, sine bar, auto-collimator, comparator- mechanical, electrical, optical, surface finish.		
	18 <sup>th</sup>	Micro and macro deviation, factors influencing surface finish and evaluation of surface finish.		
10 <sup>th</sup>	19 <sup>th</sup>	Machine tools: Introduction, constructional features, specialization, operations and devices of basic machine tools.		
	20 <sup>th</sup>	Lathe, shaper, planner, drilling machining, and milling machine, indexing in milling operation.		
11 <sup>th</sup>	21 <sup>th</sup>	Working principles of capstan and turret lathes.		
	22 <sup>nd</sup>	Metal Casting Process: Introduction, Foundry: Introduction to Casting Processes, Basic Steps in Casting Processes. Pattern: Types of Pattern and Allowances.		
12 <sup>th</sup>	23 <sup>rd</sup>	Sand Casting: Sand Properties, Constituents and Preparation. Mould & Core making with assembly and its Types. Gating System.		
	24 <sup>nd</sup>	Melting of Metal, Furnaces and Cupola, Metal Pouring, Fettling. Casting Treatment, Inspection and Quality Control, Sand Casting Defects & Remedies		
13 <sup>th</sup>	25 <sup>nd</sup>	Welding: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding.		

	26 <sup>nd</sup>	Arc Welding: Metal Arc, TIG & MIG Welding, Submerged arc welding (SAW), resistance welding principles, electrode types and selection.		
14 <sup>th</sup>	27 <sup>nd</sup>	Thermit welding, electro slag welding, electron beam welding, laser beam welding, forge welding, friction welding, Welding Defects and remedies, brazing & soldering.		
	28 <sup>nd</sup>	Forming Processes: Basic Principle of Hot & Cold Working, Hot & Cold Working Processes.		
15 <sup>th</sup>	29 <sup>nd</sup>	Rolling, Extrusion, Forging, Drawing, Wire Drawing and Spinning. Sheet Metal Operations:		
	30 <sup>nd</sup>	Measuring, Layout marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining.		