

# कायालय प्राचाय, शासकीय पॉलीटेक्निक जशपुर (छ.ग.)

ग्राम-झरगॉव, पोस्ट- घोलेंग, तह. जशपुर , जिला- जशपुर (छ.ग.) पिन कोड &496338

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## LESSON PLAN SESSION JUL – DEC 2024-25

SUBJECT: **Machine Tool Technology 2037573(037)**

SEMESTER: **5TH**

BRANCH: - MECHANICAL ENGINEERING

UNIT NUMBER	NAME OF THE TOPIC	NO OF CLASS REQUIRED	REMARK
Unit-1.0 Metal cutting	1.1 Cutting Tools-types, requirements, specification & application of different cutting tools, cutting tool materials -high carbon steels, high speed steels, non-ferrous cast alloys, cemented carbides, ceramics, diamond, Cubic Boron Nitride, properties and applications	02	
	1.2 Geometry of Single Point Cutting Tool - Tool angle, Tool geometry and influence of tool angles, tool signature, Tool angle specification system, ASA, ORS and inter-relationship.	05	
	1.3 Mechanics of Metal Cutting -Theories of metal cutting, Chip formation, types of chips, BUE formation condition and its effect upon surface finish, chip breakers, Orthogonal and Oblique cutting, stress and strain in the chip, velocity relations, power and energy requirement in metal cutting.	05	
Unit-2.0 Mechanics of machining	2.1 Cutting forces and tool life -Forces acting on the cutting tool and their measurement, Merchant's circle diagram, dynamometer, force and velocity relationship, Tool wear, Factors causing wear, tool life, tool life equation, variables affecting tool life, Cutting parameters - speed, feed, depth of cut and machining time, economical cutting speed.	06	
	2.2 Machinability - Concept and evaluation of Machinability, Mechanism of Tool failure, Machinability index, factors affecting machinability.	03	
	2.3 Thermal Aspects in Machining-Sources of heat generation in machining and its effects, Temperature Measurement techniques in machining, types of cutting fluids, Functions of cutting fluid, Characteristics of cutting fluid, Application of cutting fluids	04	
Unit-3.0 Shaper, Planner and Drilling machine	3.1 Shaper: Principle of operation, classification, specification, Basic parts and their functions and Applications, safety precautions.	03	
	3.2 Slotter : Principle of working, classification, specification. Basic parts of Slotting machine and their functions and Applications, safety precautions.	03	
	3.3 Planer: Principle of operation, Classification, Basic parts and their functions, Specifications and Applications, safety precautions.	04	
	3.4 Drilling, Reaming & Boring: Drilling: Principle of operation, Classification, Basic parts and functions, drill nomenclature, other operations like counter boring, counter sinking, spot facing etc. Reaming: Principle of operation, description of	04	

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	reamers, and types of reaming operations, safety precautions, Boring: Principle of operation, Classification of boring machines, Basic parts and functions, boring operations, boring tools and applications, safety precautions.		
<b>Unit-4. Milling and Broaching operations</b>	4.1 Milling: Principle of operation, Classification of milling machines, Basic parts and their functions, Specifications	02	
	4.2 Milling cutters - Different types of cutters used in milling, face milling cutter, end milling cutter, Staggered tooth milling cutter, side and face milling cutter, form milling cutters, metal slitting saw etc.	02	
	4.3 Milling operations - Plain milling, face milling, side milling, end milling, straddle milling, gang milling, slotting, slitting, Up milling and down milling, safety precautions	02	
	4.4 Dividing head-types, function of dividing head, method of indexing, index plates.	02	
	4.5 Broaching: Principle of operation, types of broaches-horizontal, vertical, pull, surface-internal and external broaching machines, Basic parts and their function, nomenclature of broach..	04	
<b>Unit-5.0 Grinding and Finishing Processes</b>	5.1 Grinder and types of grinding wheel, Types of abrasive materials and their properties, Bonding materials, Grinding wheel classification, condition for selection of grinding wheels, balancing of grinding wheels, glazing, loading dressing and Truing. Designation of grinding wheel	04	
	5.2 Principles of working of grinding machines and functions of main parts, types of grinding processes, function of tool and work holding devices, Table drive in surface and cylindrical grinders, Types of lubricants and coolants used in Grinding, Grinding defects, their remedy and safety practices	03	
	5.3 Finishing Processes Definition of micro finishing, honing, lapping, super finishing, polishing and buffing operations, equipment involved, materials used, Tolerances obtained and limitations and applications.	03	
Total Classes Required		61	

  
Subject I/C- PRANITA SORENG  
LECTURER, Mechanical Engineering, GPJ

HOD  
Department of Mechanical Engineering