

BBS College of Engineering and Technology Prayagraj

Lecture Plan

Department	Mechanical Engineering Department
Program/Year/Semester/Sec	B.Tech/2025/ 2 nd / 4 th
Course Name/ Course Title	B.Tech/ Manufacturing Process
Course Code	BME-403
Name of Faculty	Mr Santosh Kumar Verma
Department of Faculty	Mechanical Engineering Dept.
Type of Course	Theory/Lecture
Contact hours	51 hrs

Course Outcomes (COs)

At the end of this course students will demonstrate the ability to:	
CO1	Students will learn the various conventional manufacturing processes / casting and forming processes.
CO2	Students will understand the concepts of metal cutting and CNC machining.
CO3	Students will comprehend the knowledge of grinding and super finishing processes.
CO4	Students will understand the concepts of metal joining processes.
CO5	Students will learn the concepts of unconventional machining processes.

Unit	Topic & sub – topic	Topics Covered	COs	Lectures proposed	Lecture delivered	Date	No. of students present (54)	Sign. of faculty
	Unit-1: Conventional Manufacturing processes							
	Casting and moulding: Metal casting processes and equipment, Types of Patterns and Pattern Allowance, Heat transfer and solidification, shrinkage, riser design, casting defects and residual stresses.		CO1	2				
	Heat transfer and solidification, shrinkage, riser design, casting defects and residual stresses.		CO1	2				
	Introduction to bulk and sheet metal forming, plastic deformation and yield criteria; fundamentals of hot and cold working processes;		CO1	2				
	Load estimation for bulk forming (forging, rolling, extrusion, drawing)		CO1	2				
	sheet forming (shearing, deep drawing, bending), principles of powder metallurgy.		CO1	2				
	Tentative no of Lecture Required to complete the Unit-1			10				
	Unit-2 : Metal cutting							
2	Single and multi-point cutting; Orthogonal cutting, various force components:		CO2	2				
	Chip formation, Tool wear and tool life, Surface finish and integrity, Machinability		CO2	2				
	Cutting tool materials, cutting fluids, Coating; Turning, Drilling, Milling and finishing processes,		CO2	2				
	Introduction to CNC machining, Additive manufacturing, Rapid prototyping and rapid tooling		CO2	2				
	Tentative no of Lecture Required to complete the Unit-2			08				
	Unit-3 Grinding & Super finishing							
3	Introduction: Grinding & Super finishing:		CO3	2				
	Grinding: Grinding wheels, abrasive & bonds, cutting action. Grinding wheel specification.		CO3	2				
	Grinding wheel wear - attritions wear, fracture wear.		CO3	2				
	Dressing and Truing. Max chip thickness and Guest criteria.		CO3	2				
	Surface and cylindrical grinding. Centreless grinding. Super finishing: Honing, lapping and polishing.		CO3	2				
	Tentative no of Lecture Required to complete the Unit-3			10				

4	Unit-4 : Metal Joining (Welding)							
	Metal Joining (Welding): Introduction		CO4	2				
	Joining/fastening processes: Physics of welding, brazing and soldering; design considerations in welding,		CO4	2				
	Solid and liquid state joining processes, Survey of welding and allied processes.,		CO4	2				
	Gas welding and cutting, process and equipment. Arc welding: Power sources and consumables. TIG & MIG processes and their parameters		CO4	2				
	Resistance welding - spot, seam projection etc. Other welding processes such as atomic hydrogen,		CO4	2				
	submerged arc, electroslag, friction welding. Weld decay in HAZ.			2				
	Tentative no of Lecture Required to complete the Unit-4			12				
5	Unit-5 : Unconventional Machining Processes							
	Unconventional Machining Processes:		CO5	2				
	Abrasive Jet Machining, Water Jet Machining, Abrasive Water Jet Machining,		CO5	2				
	Ultrasonic Machining, principles and process parameters. Electrical Discharge Machining, principle and processes parameters,		CO5	2				
	MRR, surface finish, tool wear, dielectric, power and control circuits, wire EDM;		CO5	2				
	Electrochemical machining (ECM), Laser Beam Machining (LBM), Plasma Arc Machining (PAM) and Electron Beam Machining		CO5	3				
	Tentative no of Lecture Required to complete the Unit-5			11				
	Total Lectures			51				

Text Books & References	
	1. Kalpakjian and Schmid, Manufacturing processes for engineering materials (5th Edition)- Pearson India, 2014.
	2. Mikell P. Groover, Fundamentals of Modern Manufacturing: Materials, Processes, and Systems.
	3. Manufacturing Technology by P.N. Rao., MCGRAW HILL INDIA.
	4. Principles of Foundry Technology, Jain, MCGRAW HILL INDIA
	5. Degarmo, Black &Kohser, Materials and Processes in Manufacturing.

Signature of Faculty

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