

# कार्यालय प्राचार्य, शासकीय पॉलीटेक्निक जशपुर (छ.ग.)

ग्राम-झरगोव, पोस्ट- घोलेग, तह. जशपुर, जिला- जशपुर (छ.ग.) पिन कोड -496338

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## LESSON PLAN SESSION JAN-JULY 2025

SUBJECT: Manufacturing Process

SEMESTER: 4<sup>th</sup>

BRANCH: - MECHANICAL ENGINEERING

UNIT NUMBER	NAME OF THE TOPIC	NO OF CLASS REQUIRED	REMARK
UNIT 01: Introduction to Manufacturing Processes	1.1 Classification of basic manufacturing process based on chip-less and chip- removal processes, Primary and Secondary manufacturing processes, Various generating & forming processes,	02	
	1.2 Factors which influence selection of manufacturing process for a particular application.	02	
	1.3 Recall mechanical properties of metals.	02	
Unit 02: Metal Casting	2.1 Definition and Need.	01	
	2.2&2.3 Pattern: types, materials, pattern allowances, color code, applications. Cores: Need, types, materials	04	
	2.4 Moulds: Molding sand: Types, properties, binders, additives, mixing, Molding equipments & tools Type of moulds, mould making, applications	02	
	2.5&2.6 Melting of metal: Pit furnace, Cupola, Induction furnace. Metal pouring: Gates and Risers.	04	
	2.7 Casting Processes: Dry sand mould casting, Shell mould casting, Investment casting, Die casting, Centrifugal casting.	06	
	2.8 Casting defects: Blow, scar, blister, gas holes, pin holes, porosity, drop, inclusion, dross, dirt, wash, buckle, scab, rat tail, penetration, swell, misrun, cold shut, hot tear, shrinkage cavity, mould shift, core shift and	01	
	2.9&2.10 Inspection of castings: Visual inspection, pressure test, magnetic particle inspection, dye penetration inspection, Radiographic inspection, ultrasonic inspection. Safety precautions in metal casting.	01	
Unit 03: Metal Forming and Press working	3.1 Cold and Hot working of metals, effect on metal properties, advantages & limitations.	03	
	3.2&3.3 Forming processes, types, working principle, tools and equipment, applications of: Rolling, Forging, Drawing, Deep drawing, Extrusion. Safety precautions.	04	
	3.4 Press working: Emphasis that press working is not forming process, Punching, Blanking, Notching, Lancing, Slitting, Nibbling, Trimming	03	

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Unit 04: Metal Joining	4.1 Classification, recall gas and arc welding processes.	02	
	4.2 Working principle, equipment, sketch, process parameters, applications of: (i) MIG, TIG, Flux coated arc and submerged arc (ii) Resistance welding – Butt, Seam, Spot, Projection and Percussion. (iii) Thermit welding. (iv) Forged welding	06	
	4.3, 4.4 & 4.5 Effects of welding heat. Weld defect and their causes. Safety precaution in welding.	02	
	5.1 & 5.2 Plastic Molding: Concept, working principle, equipment and applications of Compression molding Safety precaution	04	
Unit 05: Plastic Molding and Powder Metallurgy	5.3 Powder Metallurgy: Introduction, advantages and disadvantages, Powder metallurgy processes: Powder making, blending, compacting, sintering, infiltration and impregnation, Applications	05	
	5.4 Safety Precautions	01	
Total Class Required		55	

Lecturer Name & Sign  
P. K. Gupta.