

कार्यालय प्राचार्य, छत्तीसगढ़ इंस्टीट्यूट ऑफ टेक्नोलॉजी जशपुर (छ.ग.)

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

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LESSON PLAN SESSION April-May 2025-26

SUBJECT: **Advanced Manufacturing Processes**

SEMESTER: **6th**

BRANCH: - **MECHANICAL ENGINEERING**

UNIT NUMBER	NAME OF THE TOPIC	NO OF CLASS REQUIRED	REMARK
Unit 1.0 Non-Conventional Machining Processes	1.1 Need of advance manufacturing, manufacturing trends and challenges, manufacturing aspects. 1.2 Types of non-conventional machining processes and energy source utilized.	02	
	1.3 Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Electrical discharge machining (EDM), Laser beam machining(Cutting)	02	
	Wire Electrical discharge machining (WEDM), Electrochemical Machining (ECM)	03	
	Plasma arc machining(PAM), Abrasive jet machining (AJM)	03	
	Ultrasonic Machining(USM), Electron Beam Machining (EBM),	03	
Unit 2.0 Advanced casting processes	2.1 Metal casting basics, Gating and riser design,	02	
	2.2 Working principle, set up, process parameters, Advantages, limitations and applications of Evaporative pattern casing process (EPC),Centrifugal and pressure die casting	03	
	Slush casting, Hybrid EPC process, Vacuum EPC, Shell Molding Process.	03	
Unit 3.0 Advanced Welding and Forming Processes	3.1 Working principle, setup, Process parameter Advantages, limitation and application- Orbital TIG welding	02	
	Electron beam welding (EBW), Laser beam welding (LBW),	02	
	Ultrasonic welding. Industrial adhesive and Adhesive bonding	03	
	3.2 Advanced Metal forming-High energy rate forming, Electro-magnetic forming	03	
	Explosive forming, Electrohydraulic forming,	03	
	Stretch forming, Contour roll forming.	02	
Unit 4.0 Gear Manufacturing	4.1 Types of gear and Gear manufacturing methods. 4.2 Gear Hobbing- Types and working principle of gear hobbing, Advantages, limitations and application	03	
	4.3 Gear Shaping-Gear Shaping by pinion cutter, Gear Shaping by rack cutter, Advantages, limitation and application of both the methods and comparison of gear hobbing and gear shaping.	03	
	4.4 Gear Finishing methods-Need of gear finishing and different methods of gear finishing like: a) Gear shaving b) Gear grinding c) Gear burnishing d) Gear lapping e) Gear honing	02	

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	f) Gear tooth rounding		
Unit 5.0 Recent trends in CAM	5.1 Additive manufacturing: 3D printing, Rapid prototyping. 5.2 Construction and working of 3D printer.	02	
	5.3 Type and properties of material for 3D printer and Rapid prototyping machine.	03	
	5.4 File format: STL (Stereo Lithography). 5.5 3D printer software: part import, orientation, processing and printing.	03	
	5.6 Computer Integrated Manufacturing (CIM): concept, definition, areas covered and benefits. 5.7 Automation-Define, need of automation, high and low cost automation, examples of automations.	03	
	5.8 Types of Automation -Fixed (Hard) automation, Programmable automations and Flexible automations (Soft). 5.9 Group Technology concept, basis for developing part families, part classification and coding with example, concept of cellular manufacturing. Advantages and limitations.	03	
Total Class Required		60	

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