



APATI INSTITUTE OF ENGINEERING & TECHNOLOGY(Polytechnic),JAGATPUR,CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING.

LESSON PLAN-2026 WINTER

Discipline : Mechanical Engineering	Semester:3rd	Name of the Teaching Faculty:- Er. TIMASWAR MALLIK
Subject – MANUFACTURING PROCESSES [MEPC-201 TH:1]	No. of days/week Class allotted-3	Semester from Date:01.07.2026 to Date 05.11.2026 No .of weeks-15
Week	Class Day	Theory Topics
1st	1st	Unit-I Cutting Fluids & Lubricants: Cutting Fluids & Lubricants: Introduction
	2nd	Types of cutting fluids, Fluids and coolants required in turning, drilling, shaping, sawing & broaching.
	3rd	Selection of cutting fluids, methods of application of cutting fluid; Classification of lubricants(solid, liquid, gaseous);
2nd	1st	Properties and applications of lubricants.
	2nd	Lathe Operations: Types of lathes – light duty, medium duty and heavy duty geared lathe, CNC lathe
	3rd	Specifications; Basic parts and their functions.
3rd	1st	Operations and tools – Turning, parting off, Knurling, facing
	2nd	facing, Boring, drilling, threading, step turning, taper turning.
	3rd	Nomenclature of single point cutting tool of lathe.
4th	1st	Unit-II Broaching Machines: Introduction to broaching
	2nd	Types of broaching machines – Horizontal type (Single ram & duplex ram). Vertical type, pull up, pull down, and push down;
	3rd	Elements of broach tool; broach teeth details.
5th	1st	Nomenclature; Tool materials. Drilling.
	2nd	Classification; Basic parts and their functions.
	3rd	Radial drilling machine.
6th	1st	Types of operations
	2nd	Specifications of drilling machine
	3rd	Types of drills and reamers
7th	1st	Unit-III Welding: Classification; Gas welding techniques.
	2nd	Types of welding flames
	3rd	Arc Welding – Principle, Equipment
8th	1st	Applications; Shielded metal arc welding; Submerged arc welding
	2nd	TIG / MIG welding; Resistance welding - Spot welding
	3rd	Seam welding, Projection welding;
9th	1st	Welding defects; Brazing and soldering: Types, Principles, Applications. Milling: Introduction; Types of milling machines: plain, Universal, vertical; constructional details – specifications;
	2nd	Milling operations: simple, compound and differential indexing; Milling cutters
	3rd	types; Nomenclature of teeth; Teeth materials; Tool signature of milling cutter; Tool & work holding devices

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10th	1st	Unit-IV Gear Making: Manufacture of gears – by Casting, Moulding, Stamping, Coining, Extruding.
	2nd	Rolling, Machining; Gear generating methods
	3rd	Gear Shaping with pinion cutter & rack cutter.
11th	1st	Gear hobbing; Description of gear hob.
	2nd	Operation of gear hobbing machine.
	3rd	Gear finishing processes; Gear materials and specification; Heat treatment processes applied to gears.
12th	1st	Press working: Types of presses and Specifications.
	2nd	Press working operations - Cutting, bending, Drawing, punching, blanking, notching, lancing; Die set components- punch and die shoe
	3rd	guide pin, bolster plate, stripper, stock guide, feed stock, pilot; Punch and die clearances for blanking and piercing, effect of clearance.
13th	1st	Unit-V Grinding and finishing processes: Principles of metal removal by Grinding.
	2nd	Abrasives – Natural & Artificial
	3rd	Bonds and binding processes: Vitrified, silicate, shellac, rubber, Bakelite
14th	1st	Factors affecting the selection of grind wheels: size and shape of wheel, kind of abrasive, grain size
	2nd	grade and strength of bond, structure of grain, spacing, kinds of bind material;
	3rd	Standard marking systems: Meaning of letters & numbers sequence of marking, Grades of letters.
15th	1st	Grinding machines classification:- Cylindrical, Surface, Tool & Cutter grinding machines; Construction details; Principle of center less grinding;
	2nd	Advantages & limitations of center less grinding; Finishing by grinding: Honing, Lapping, Super finishing; Electroplating: Basic principles, Plating metals, applications; Hot dipping: Galvanizing, Tin coating, Parkerizing, Anodizing
	3rd	Metal spraying: wire process, powder process and applications; Organic coatings: Oil base Paint, Lacquer base, Enamels, Bituminous paints, rubber base coating; Finishing specifications.

Learning Resources:

Text Books:

1. Workshop Technology by Hazra Choudhary Vol.-I, Vol.-II
2. Manufacturing Technology by P.N.Rao, Vol.-I, Vol.-II
3. Production Technology by O.P. Khanna, vol-I, II

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