UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

SUBJECT- MANUFACTURING PROCESSES **COURSE CODE - TH-1**

NAME OF THE FACULTY - SOUMYA RANJAN MISHRA **SEMESTER- 3RD**

ACADEMIC SESSION- 2025-26

UNIT	WEEK	NO. OF LECTURES	TOPICS TO BE COVERED
1	1st	1	**CUTTING FLUIDS & LUBRICANTS:** Introduction, types of cutting fluids
		1	Fluids and coolants required in turning,drilling,shaping,sawing &broaching
		1	Selection of cutting fluids
	2nd	1	methods of application of cutting fluid
		1	Classification of lubricants(solid,liquid,gaseous), Properties and applications of lubricants
		1	**LATHE OPERATIONS:** types of lathes- light duty, medium duty and heavy duty geared lathe
	3rd	1	CNC Lathe; specifications ;basic parts and their functions
		1	Operations and tools- Turning,parting off, knurling, facing, boring
		1	Operations and tools-Drilling,threading,step turning, taper turning
	4th	1	Nomenclature of single point cutting tool lathe
		1	**CLASS TEST 1**
2		1	**BROACHING MACHINES:** Introduction to broaching;types of broaching machines- horizontal type Single arm
	5th	1	Types of broaching machines- horizontal type duplex ram
		1	Types of broaching machines: Vertical type, pull up
		1	Types of broaching machines: pull down, and push down
	6th	1	Elements of broach tool; broach teeth details
		1	Nomenclature ; tool materials
		1	**DRILLING**: Classification; basic parts and their functions
	7th	1	Radial drilling machine; Types of operations
		1	Specifications of drilling machine; Types of drills and reamers
3		1	**WELDING**: Classification; gas welding techniques; types of welding flames
	8th	1	Arc Welding- Principle, Equipment, Applications
		1	Shielded metal arc welding, Submerged arc welding: TIG/MIG welding
		1	Resistance welding- spot welding, seam welding, Projection welding
	9th	1	Welding defects, Brazing and soldering: Types , principles, Applications
		1	**MILLING**: Introduction: Types of milling machines: plain, universal,vertical
		1	Constructional details- specificationsMilling operations; simple, compound, and differential indexing
	10th	1	Milling cutters-typesNomenclature of teeth;teeth materials;tool signature of miiling cutter
		1	tool & work holding devices
		1	**CLASS TEST -2**
	11th	1	**GEAR MAKING**: Manufacture of gears- by casting, moulding,stamping, coining, extruding, rolling

4		1	Manufacture of gears-machining, Gear generating methods;
		1	Gear shaping with pinion cutter&rack cutter
	12th	1	Gear hobbing; description of gear hob, operation of gear hobbing machine;
		1	Gear finishing processes;
		1	Gear materials and specifications; heat treatment processes applied to gears
	13th	1	**PRESS WORKING**: Types of presses and specidfications; press wporking operations- cutting, bending, drawing, punching , blanking, notching, lancing
		1	Die set components- punch and dieshoe, guide pin, bolster plate, stripper, stock guide, feed stock,pilot;
		1	Punch and die clearances for blanking and piercing, effect of clearance
5	14th	1	**GRINDING AND FINISHING PPROCESSES**: Principles of metal removal by grinding;Abrasives-
		1	Factors affecting selection of grind wheels;size and shape of wheel,, kind of abrasive, grain size, grade strength of bond,structure of grain, spacing, kinds of bind material;
		1	Standard marking systems: meaning of letters &numbers sequence of marking, grades of letters
	15th	1	Grinding machines: classification- cylindrical, surface, tool& cutter
		1	Constructional details; principle of centreless grinding; advantages and limitations
		1	Finishingby grinding, honing, lapping, superfinishing
	16th	1	Electroplating: basic principles, plating materials, Applications: hot dipping,galvanizing,Tin coating, parkerizing,anodizing
		1	Metal spraying, wire process, powder processand applications;Organic coatings;finishing specifications
		1	**CLASS TEST - 3**

11/07/25

SIGNATURE OF FACULTY

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