GOVT. POLYTECHNIC, NAYAGARH

3rd SEMESTER MECHANICAL ENGINEERING

LESSON PLAN (2025-26)

SUBJECT- MANUFACTURING PROCESSES **TOTAL PERIODS-45**

NAME OF FACULTY: Mrs. Monalisa Sahoo, Sr.Lect.. & HOD	THEORY-3P/WEEK

W.E.F : 14/07/2025 to 15/11/2025

Sl No.	week	Day	Topics to be covered
1	1st	1st day	**Cutting Fluids & Lubricants:** Introduction; Types of cutting fluids,
		2nd day	Fluids and coolants required in turning, drilling, shaping, sawing & broaching;
		3rd day	Selection of cutting fluids, methods of application of cutting fluid;
Sl No.	**week**	**Day**	**Topics to be covered**
2	2nd	1st day	Classification of lubricants (solid, liquid, gaseous),
		2nd day	Properties and applications of lubricants
		3rd day	**Lathe Operations:** Types of lathes – light duty, Medium duty and heavy duty geared lathe
Sl No.	**week**	**Day**	**Topics to be covered**
3	3rd	1st day	CNC lathe; Specifications;
		2nd day	Basic parts and their functions;
		3rd day	Operations and tools – Turning, parting off, Knurling, facing, Boring, drilling, threading, step turning, taper turning,
Sl No.	**week**	**Day**	**Topics to be covered**
4	4th	1st day	Nomenclature of single point cutting tool of lathe.
		2nd day	**Broaching Machines:** Introduction to broaching;
		3rd day	Types of broaching machines – Horizontal type (Single ram & duplex ram),
Sl No.	**week**	**Day**	**Topics to be covered**
5	5th	1st day	Vertical type, Pull up, pull down, and push down;
		2nd day	Elements of broach tool; broach teeth details; Nomenclature; Tool materials.
		3rd day	**Drilling:** Classification; Basic parts and their functions;
Sl No.	**week**	**Day**	**Topics to be covered**
		1st day	Radial drilling machine

6	6th	2nd day	Types of operations; Specifications of drilling machine;
		3rd day	Types of drills and reamers
Sl No.	week	Day	Topics to be covered
7	7th	1st day	**Welding:** Classification; Gas welding techniques; Types of welding flames;
		2nd day	Arc Welding – Principle, Equipment, Applications;
		3rd day	Shielded metal arc welding; Submerged arc welding
Sl No.	week	Day	Topics to be covered
8	8th	1st day	TIG / MIG welding;
		2nd day	Resistance welding - Spot welding, Seam welding, Projection welding;
		3rd day	Welding defects
Sl No.	week	Day	Topics to be covered
9	9th	1st day	Brazing and soldering: Types, Principles, Applications.
		2nd day	**Milling:** Introduction; Types of milling machines: plain, Universal, vertical; constructional details – specifications;
		3rd day	Milling operations: simple, compound and differential indexing;
Sl No.	week	Day	Topics to be covered
10	10th	1st day	Milling cutters – types; Nomenclature of teeth;
		2nd day	Teeth materials; Tool signature of milling cutter; Tool & work holding devices.
		3rd day	**Gear Making:** Manufacture of gears – by Casting, Moulding, Stamping, Coining Extruding, Rolling, Machining;
Sl No.	week	Day	Topics to be covered
11	11th	1st day	Gear generating methods: Gear Shaping with pinion cutter & rack cutter; Gear hobbing;
		2nd day	Description of gear hob; Operation of gear hobbing machine; Gear finishing processes; Gear materials and specification;
		3rd day	Heat treatment processes applied to gears.
Sl No.	week	Day	Topics to be covered
12	12th	1st day	**Press working:** Types of presses and Specifications,
		2nd day	Press working operations - Cutting, bending, Drawing, punching, blanking, notching, lancing;
		3rd day	Die set components- punch and die shoe, guide pin, bolster plate, stripper, stock guide, feed stock, pilot; Punch and die clearances for blanking and piercing, effect of clearance
Sl No.	week	Day	Topics to be covered

13	13th	1st day	**Grinding and finishing processes:** Principles of metal removal by Grinding; Abrasives – Natural & Artificial; Bonds and binding processes: Vitrified, silicate, shellac, rubber, bakelite; Factors affecting the selection of grind wheels: size and shape of wheel, kind of abrasive, grain size, grade and strength of bond, structure of grain, spacing, kinds of bind material;
		2nd day	**Standard marking systems:** Meaning of letters & numbers sequence of marking, Grades of letters;
		3rd day	Grinding machines classification-: Cylindrical, Surface, Tool & Cutter grinding machines;
Sl No.	**week**	**Day**	**Topics to be covered**
14	14th	1st day	Construction details; Principle of centreless grinding; Advantages & limitations of centreless grinding;
		2nd day	Finishing by grinding: Honing, Lapping, Super finishing;
		3rd day	Electroplating: Basic principles, Plating metals, applications; Hot dipping: Galvanizing, TiN coating, Parkerizing, Anodizing;
Sl No.	**week**	**Day**	**Topics to be covered**
15	15th	1st day	Metal spraying: wire process, powder process and applications; Organic coatings: Oil base Paint, Lacquer base, Enamels, Bituminous paints, rubber base coating;
		2nd day	Finishing specifications
		3rd day	REVISION

REFERENCES:

1. Manufacturing technology – P N Rao, Tata McGraw-Hill Publications
2. Elements of workshop Technology (Volume I & II) – S. K. Hajra Chaudary, Bose & Roy, Media Promoters and Publishers Limited.
3. Production Technology (Volume I & II) – O. P. Khanna & Lal, Dhanpat Rai Publications.
4. Fundamental of metal cutting and machine tools– B. L. Juneja, New age international limited.
5. Manufacturing Technology, Metal Cutting & Machine tools– P. N. Rao, Tata McGraw-Hill Publications

11/07/25

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