

# LESSON PLAN

**SUB: MANUFACTURING PROCESSES**

**BRANCH:- MECHANICAL ENGG.**

**SEMESTER: 3rd**

**NAME OF FACULTY: ER. BIKASH MURMU**



**GOVERNMENT POLYTECHNIC,  
BHADRAK**


**SESSION:2025-26**

Hod ,Mechanical

Academic Co-ordinator  
**Academic Co-ordinator**

Principal  
Govt. Polytechnic, Bhadrak

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| <b>Discipline:</b><br><b><u>MECHANICAL</u></b>     | <b>Semester:</b> <b><u>3rd</u></b>                     | <b>Name of the Teaching Faculty:</b> <b><u>ER. BIKASH MURMU</u></b><br><b><u>Sr.Lecturer Mechanical</u></b>                |
| <b>Subject:</b> TH-I<br>MANUFACTURING<br>PROCESSES | <b>No. of days/perweek class allotted:</b><br><b>3</b> | <b>Semester From date:</b> <b>14/07/2025 To date:</b><br><b>15-11-2025</b><br><b>No of weeks: 15</b>                       |
| <b>Week</b>  | <b>Class Day</b>                                       | <b>Theory Topics:</b>  |
| <b>1<sup>st</sup></b>                              | <b>1<sup>st</sup></b>                                  | <b>Cutting Fluids &amp; Lubricants:</b><br>Introduction; Types of cutting fluids,  |
|  | <b>2<sup>nd</sup></b>                                  | Fluids and coolants required in turning, drilling, shaping, sawing & broaching;  |
|  | <b>3<sup>rd</sup></b>                                  | Selection of cutting fluids, methods of application of cutting fluid;  |
| <b>2<sup>nd</sup></b>                              | <b>1<sup>st</sup></b>                                  | Classification of lubricants (solid, liquid, gaseous),   |
|  | <b>2<sup>nd</sup></b>                                  | Properties and applications of lubricants  |
|  | <b>3<sup>rd</sup></b>                                  | <b>Lathe Operations:</b><br>Types of lathes – light duty, Medium duty and heavy duty geared lathe, CNC lathe;              |
| <b>3<sup>rd</sup></b>                              | <b>1<sup>st</sup></b>                                  | Specifications; Basic parts and their functions;   |
|  | <b>2<sup>nd</sup></b>                                  | Operations and tools – Turning, parting off, Knurling, facing, Boring, drilling, threading, step turning, taper turning,   |
|  | <b>3<sup>rd</sup></b>                                  | Operations and tools – Turning, parting off, Knurling, facing, Boring, drilling, threading, step turning, taper turning,   |
| <b>4<sup>th</sup></b>                              | <b>1<sup>st</sup></b>                                  | Nomenclature of single point cutting tool of lathe.  |
|  | <b>2<sup>nd</sup></b>                                  | <b>Broaching Machines:</b><br>Introduction to broaching;   |
|  | <b>3<sup>rd</sup></b>                                  | Types of broaching machines – Horizontal type (Single ram & duplex ram), Vertical type, Pull up, pull down, and push down; |
| <b>5<sup>th</sup></b>                              | <b>1<sup>st</sup></b>                                  | Types of broaching machines – Horizontal type (Single ram & duplex ram), Vertical type, Pull up, pull down, and push down; |
|  | <b>2<sup>nd</sup></b>                                  | Types of broaching machines – Horizontal type (Single ram & duplex ram), Vertical type, Pull up, pull down, and push down; |
|  | <b>3<sup>rd</sup></b>                                  | Elements of broach tool; broach teeth details; Nomenclature; Tool materials.   |

  
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| 6 <sup>th</sup>  | 1 <sup>st</sup> | Elements of broach tool; broach teeth details; Nomenclature; Tool materials.  |
|                  | 2 <sup>nd</sup> | <b>Drilling:</b><br>Classification; Basic parts and their functions;  |
|                  | 3 <sup>rd</sup> | CLASS TEST-1  |
| 7 <sup>th</sup>  | 1 <sup>st</sup> | Radial drilling machine; Types of operations;   |
|                  | 2 <sup>nd</sup> | Specifications of drilling machine; Types of drills and reamers   |
|                  | 3 <sup>rd</sup> | <b>Welding:</b><br>Classification; Gas welding techniques; Types of welding flames;   |
| 8 <sup>th</sup>  | 1 <sup>st</sup> | Arc Welding – Principle, Equipment, Applications; Shielded metal arc welding; Submerged arc welding; TIG / MIG welding;                       |
|                  | 2 <sup>nd</sup> | Arc Welding – Principle, Equipment, Applications; Shielded metal arc welding; Submerged arc welding; TIG / MIG welding;                       |
|                  | 3 <sup>rd</sup> | Resistance welding - Spot welding, Seam welding, Projection welding; Welding defects; Brazing and soldering: Types, Principles, Applications. |
| 9 <sup>th</sup>  | 1 <sup>st</sup> | Resistance welding - Spot welding, Seam welding, Projection welding; Welding defects; Brazing and soldering: Types, Principles, Applications. |
|                  | 2 <sup>nd</sup> | <b>Milling:</b><br>Introduction; Types of milling machines: plain, Universal, vertical; constructional details specifications;                |
|                  | 3 <sup>rd</sup> | Milling operations: simple, compound and differential indexing; Milling cutters – types;  |
| 10 <sup>th</sup> | 1 <sup>st</sup> | Nomenclature of teeth; Teeth materials; Tool signature of milling cutter; Tool & work holding devices.  |
|                  | 2 <sup>nd</sup> | Nomenclature of teeth; Teeth materials; Tool signature of milling cutter; Tool & work holding devices.  |
|                  | 3 <sup>rd</sup> | <b>Gear Making:</b><br>Manufacture of gears – by Casting, Moulding, Stamping, Coining Extruding, Rolling, Machining                           |

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| 11 <sup>th</sup> | 1 <sup>st</sup> | Gear generating methods: Gear Shaping with pinion cutter & rack cutter; Gear hobbing;   |
|                  | 2 <sup>nd</sup> | Description of gear hob; Operation of gear hobbing machine; Gear finishing processes;   |
|                  | 3 <sup>rd</sup> | Gear materials and specification; Heat treatment processes applied to gears.  |
| 12 <sup>th</sup> | 1 <sup>st</sup> | Gear materials and specification; Heat treatment processes applied to gears.  |
|                  | 2 <sup>nd</sup> | <b>Press working:</b><br>Types of presses and Specifications, Press working operations - Cutting, bending, Drawing, punching, blanking, notching, lancing;  |
|                  | 3 <sup>rd</sup> | Types of presses and Specifications, Press working operations - Cutting, bending, Drawing, punching, blanking, notching, lancing;   |
| 13 <sup>th</sup> | 1 <sup>st</sup> | Types of presses and Specifications, Press working operations - Cutting, bending, Drawing, punching, blanking, notching, lancing;   |
|                  | 2 <sup>nd</sup> | Punch and die clearances for blanking and piercing, effect of clearance.  |
|                  | 3 <sup>rd</sup> | CLASS TEST-2  |
| 14 <sup>th</sup> | 1 <sup>st</sup> | <b>Grinding and finishing processes:</b><br>Principles of metal removal by Grinding; Abrasives – Natural & Artificial; Bonds and binding processes: Vitrified, silicate, shellac, rubber, bakelite;   |
|                  | 2 <sup>nd</sup> | 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; Standard marking systems: Meaning of letters & numbers sequence of marking, Grades of letters; |
|                  | 3 <sup>rd</sup> | Grinding machines classification:- Cylindrical, Surface, Tool & Cutter grinding machines; Construction details; Principle of centreless grinding; Advantages & limitations of centreless grinding;  |
| 15 <sup>th</sup> | 1 <sup>st</sup> | Finishing by grinding: Honing, Lapping, Super finishing; Electroplating: Basic principles, Plating metals, applications; Hot dipping: Galvanizing, TiN coating, Parkerizing, Anodizing; Metal spraying;   |
|                  | 2 <sup>nd</sup> | wire process, powder process and applications; Organic coatings: Oil base Paint, Lacquer base, Enamels, Bituminous paints, rubber base coating; Finishing specifications.   |
|                  | 3 <sup>rd</sup> | Discuss the previous year question  |

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