



**GOVERNMENT POLYTECHNIC, NABARANGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

Discipline: <b>MECHANICAL ENGG</b>	Semester: <b>4<sup>TH</sup></b>	Name of the Teaching Faculty:
Subject: <b>MANUFACTURING TECHNOLOGY</b>	No. of days/per week class allotted: <b>04</b>	Semester From date: _____ To Date: _____ No. of Weeks: <b>15</b>
<b>COURSE OUTCOMES</b>	<ol style="list-style-type: none"> <li>1. Comprehending required material properties for cutting tools</li> <li>2. Comprehending machining mechanism principle and factors affecting machining performance</li> <li>3. Comprehending working principle and components in machining tools including lathe, milling, shaping, planing, slotting machines</li> <li>4. Comprehending requirement of surface finish and realize principles involved in grinding and super finishing operations</li> </ol>	
<b>Week</b>	<b>Class Day</b>	<b>Theory/Practical Topics</b>
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>Tool Materials</b> - Introduction
	2 <sup>ND</sup>	Composition of various tool materials
	3 <sup>RD</sup>	Physical properties & uses of such tool materials.
	4 <sup>TH</sup>	Revision
2 <sup>ND</sup>	1 <sup>ST</sup>	<b>Cutting Tools - Introduction</b>
	2 <sup>ND</sup>	Cutting action of various tools such as Chisel, hacksaw blade, dies and reamer
	3 <sup>RD</sup>	Contd.
	4 <sup>TH</sup>	Turning tool geometry and purpose of tool angle
3 <sup>RD</sup>	1 <sup>ST</sup>	Machining process parameters (Speed, feed and depth of cut)
	2 <sup>ND</sup>	Coolants and lubricants in machining and purpose
	3 <sup>RD</sup>	<b>Lathe Machine – Introduction</b> Construction and working of lathe and CNC lathe
	4 <sup>TH</sup>	Contd.
4 <sup>TH</sup>	1 <sup>ST</sup>	Major components of a lathe and their function Operations carried out in a lathe (Turning, thread cutting, taper turning, internal machining, parting off, facing, knurling)
	2 <sup>ND</sup>	Safety measures during machining
	3 <sup>RD</sup>	Capstan lathe Difference with respect to engine lathe
	4 <sup>TH</sup>	Major components and their function Define multiple tool holders
5 <sup>TH</sup>	1 <sup>ST</sup>	Turret Lathe Difference with respect to capstan lathe Major components and their function
	2 <sup>ND</sup>	Draw the tooling layout for preparation of a hexagonal bolt & bush
	3 <sup>RD</sup>	<b>Shaper - Introduction</b> Potential application areas of a shaper machine
	4 <sup>TH</sup>	Major components and their function

6 <sup>TH</sup>	1 <sup>ST</sup>	Explain the automatic able feed mechanism
	2 <sup>ND</sup>	Explain the construction & working of tool head
	3 <sup>RD</sup>	Explain the quick return mechanism through sketch
	4 <sup>TH</sup>	State the specification of a shaping machine.
7 <sup>TH</sup>	1 <sup>ST</sup>	<b>Planning Machine - Introduction</b>
	2 <sup>ND</sup>	Application area of a planer and its difference with respect to shaper
	3 <sup>RD</sup>	Major components and their functions
	4 <sup>TH</sup>	The table drive mechanism
8 <sup>TH</sup>	1 <sup>ST</sup>	Working of tool and tool support
	2 <sup>ND</sup>	Clamping of work through sketch
	3 <sup>RD</sup>	<b>Milling Machine - Introduction</b> Types of milling machine and operations performed by them and also same for CNC milling machine
	4 <sup>TH</sup>	Contd.
9 <sup>TH</sup>	1 <sup>ST</sup>	Explain work holding attachment
	2 <sup>ND</sup>	Construction & working of simple dividing head, universal dividing head
	3 <sup>RD</sup>	Contd.
	4 <sup>TH</sup>	Procedure of simple and compound indexing
10 <sup>TH</sup>	1 <sup>ST</sup>	Illustration of different indexing methods
	2 <sup>ND</sup>	<b>Slotter – Introduction , Types</b>
	3 <sup>RD</sup>	Contd.
	4 <sup>TH</sup>	Major components and their function
11 <sup>TH</sup>	1 <sup>ST</sup>	Construction and working of slotter machine
	2 <sup>ND</sup>	Contd.
	3 <sup>RD</sup>	Tools used in slotter
	4 <sup>TH</sup>	<b>Grinding - Introduction</b> Significance of grinding operations
12 <sup>TH</sup>	1 <sup>ST</sup>	Manufacturing of grinding wheels
	2 <sup>ND</sup>	Criteria for selecting of grinding wheels
	3 <sup>RD</sup>	Specification of grinding wheels with example
	4 <sup>TH</sup>	Working of Cylindrical Grinder
13 <sup>TH</sup>	1 <sup>ST</sup>	Surface Grinder Centre less Grinder
	2 <sup>ND</sup>	<b>Internal Machining operations</b> Classification of drilling machines
	3 <sup>RD</sup>	Working of Bench drilling machine Pillar drilling machine Radial drilling machine
	4 <sup>TH</sup>	Contd.
14 <sup>TH</sup>	1 <sup>ST</sup>	Boring - Basic Principle of Boring Difference between Boring and drilling
	2 <sup>ND</sup>	Contd. & Broaching
	3 <sup>RD</sup>	Types of Broaching (pull type, push type) Advantages of Broaching and applications
	4 <sup>TH</sup>	<b>Surface finish, lapping</b> Definition of Surface finish
15 <sup>TH</sup>	1 <sup>ST</sup>	Description of lapping & explain their specific cutting.
	2 <sup>ND</sup>	Contd.
	3 <sup>RD</sup>	REVISION
	4 <sup>TH</sup>	REVISION

**LEARNING RESOURCES:**

Sl. No.	Name of the Book	Author Name
1.	Text Book of Workshop Technology	Hazra Choudhury Vol.-I & II
2.	Text Book of Workshop Technology	W.A.S Chapman Vol.-I & II
3.	Text Book of Manufacturing Process	P.N. Rao

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