

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

COURSE PLAN

Subject: **MANUFACTURING TECHNOLOGY**

Semester, Academic Year: 4th Semester, 2022

Course Faculty: **Mr. Aurobinda Biswas**

Theory: 4 Periods per Week

Total Periods: 60 Periods

Examination: 3 Hours

I.A: 20 Marks

End Sem Exam: 80 Marks

Total Marks: 100 Marks

Course Outcomes:

On completion of the subject, the student will be able to do:

1. Comprehending required material properties for cutting tools.
2. Comprehending machining mechanism principle and factors affecting machining performance.
3. Comprehending working principle and components in machining tools including lathe, milling, shaping, planing, slotting machines.
4. Comprehending requirement of surface finish and realize principles involved in grinding and super finishing operations.

Lesson Plan Duration: 15 weeks (from March 2022 to June 2022)

Week	Class Day	Theory Topics	Remarks
1st	1 to 4	Tool Material	
		<ul style="list-style-type: none">• Composition of various tool materials• Physical properties & uses of such tool materials	
2nd	5 to 8	Cutting Tools	
		<ul style="list-style-type: none">• Cutting action of various tools such as Chisel, hacksaw blade, dies and reamers• Turning tool geometry and purpose of tool angle• Machining process parameters (Speed, feed and depth of cut)	

3rd	9 and 10	<ul style="list-style-type: none"> • Coolants and lubricants in machining and purpose 	
	11 and 12	<p style="text-align: center;">Lathe Machine</p> <ul style="list-style-type: none"> • Construction and working of lathe and CNC lathe 	
4th	13 to 16	<ul style="list-style-type: none"> • Capstan lathe • Turret Lathe 	
5th	17 and 18	<ul style="list-style-type: none"> • Draw the tooling layout for preparation of a hexagonal bolt & bush 	
	19 and 20	<p style="text-align: center;">Shaper</p> <ul style="list-style-type: none"> • Potential application areas of a shaper machine • Major components and their function 	
6th	21 to 24	<ul style="list-style-type: none"> • Explain the automatic able feed mechanism • Explain the construction & working of tool head • Explain the quick return mechanism through sketch • State the specification of a shaping machine 	
7th	25 to 28	<p style="text-align: center;">Planning Machine</p>	
		<ul style="list-style-type: none"> • Application area of a planer and its difference with respect to shaper • Major components and their functions • The table drive mechanism 	

8th	29 and 30	<ul style="list-style-type: none"> • Working of tool and tool support • Clamping of work through sketch. 	
		Milling Machine	
	31 and 32	<ul style="list-style-type: none"> • Types of milling machine and operations performed by them and also same for CNC milling machine 	
9th	33 to 36	<ul style="list-style-type: none"> • Explain work holding attachment • Construction & working of simple dividing head, universal dividing head 	
10th	37 and 38	<ul style="list-style-type: none"> • Procedure of simple and compound indexing • Illustration of different indexing methods 	
	39 and 40	Slotter	
		<ul style="list-style-type: none"> • Major components and their function 	
11th	41 to 44	<ul style="list-style-type: none"> • Construction and working of slotter machine • Tools used in slotter 	
12th	45 to 48	Grinding	
		<ul style="list-style-type: none"> • Significance of grinding operations • Manufacturing of grinding wheels • Criteria for selecting of grinding wheels 	
13th	49 and 50	<ul style="list-style-type: none"> • Specification of grinding wheels 	
		Internal Machining operations	
	51 and 52	<ul style="list-style-type: none"> • Classification of drilling machines 	

14th	53 to 56	<ul style="list-style-type: none"> • Boring • Broaching 	
15th	57 to 60	Surface finish, lapping	
		<ul style="list-style-type: none"> • Definition of Surface finish • Description of lapping& explain their specific cutting 	

Learning Resources:

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

Books Recommended

1. Engineering Mechanics – by A.R. Basu (TMH Publication Delhi)
2. Engineering Machines – Basudev Bhattacharya (Oxford University Press).
3. Text Book of Engineering Mechanics – R.S Khurmi (S. Chand).
4. Applied Mechanics & Strength of Material – By I.B. Prasad.
5. Engineering Mechanics – By Timosheenko, Young & Rao.
6. Engineering Mechanics – Beer & Johnson (TMH Publication).