

**Course Name:** Mechanical and Production Engineering/Production Technology      **Course Code:** ME/PT/PG/MH  
**Semester** : Fourth

**Subject Title:** Production Processes      **Subject Code:** 9052

**Teaching & Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
02	--	04	03	80	20	--	--	25@	125

**Rationale:**

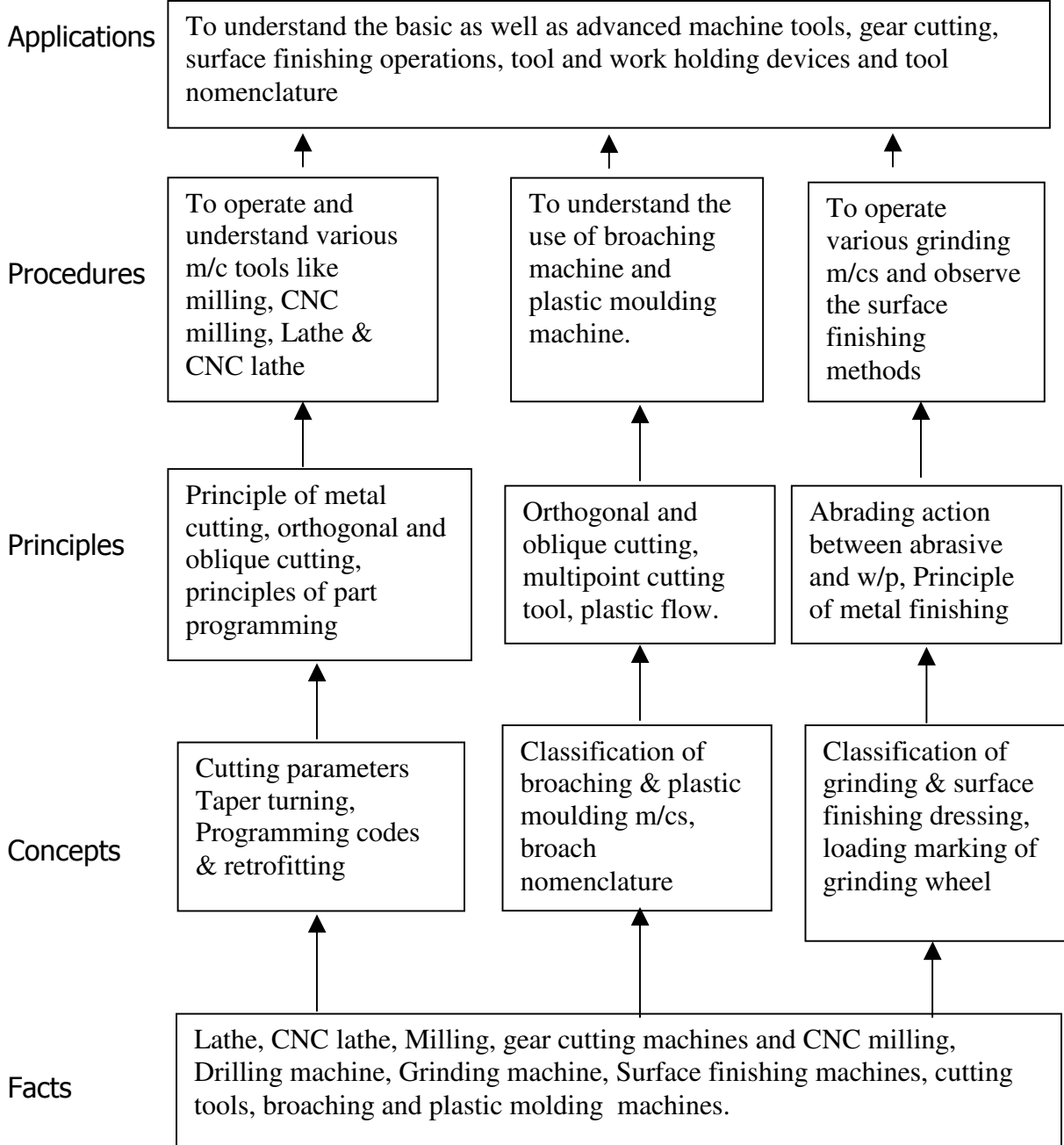
Diploma technician often comes across various types of basic production processes. He/ she is required to select, operate and control the appropriate processes for specific applications. He/ she is also required to know about various cutting tools, latest improvements in production processes, surface finishing processes and plastic processes.

**Objectives:**

The student will be able to:

- 1) Use the basic machine tools like lathe, drilling and milling.
- 2) Know about broaching machine and its applications.
- 3) Understand the importance of surface finish and related surface finishing methods..
- 4) Program and use basic on machines.
- 5) Understand and select the gear cutting processes.
- 6) Understand and select plastic moulding processes.

## Learning Structure:



<b>Contents: Theory</b>			
<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>	<b>Marks</b>
<b>01</b>	<b>Turning</b> <b>1.1 Lathe :</b> Angle calculations for taper turning. Cutting tool nomenclature and tool signature. Cutting parameters and machining time calculation.	<b>03</b>	<b>08</b>
	<b>1.2 CNC Lathe</b> Introduction, classification, advantages, positioning system, constructional features. Part programming : programming format, word, statement, block. Preparatory and miscellaneous code, Fixed cycles in programming – canned cycle, do-loop, subroutine.	<b>10</b>	<b>22</b>
<b>02</b>	<b>Drilling</b> Twist drill nomenclature. Cutting parameters , machining time calculation, Deep hole drilling.	<b>02</b>	<b>06</b>
<b>03</b>	<b>Milling and gear cutting</b> <b>3.1 Milling</b> Cutting parameters, machining time calculation, Milling operations – plain milling, side and face milling, form milling, gang milling, end milling, face milling, T- slot milling, slitting.	<b>03</b>	<b>08</b>
	<b>3.2 Gear cutting</b> Gear cutting on milling machine –Dividing head and Indexing methods Gear hobbing, Principle of operation, Advantages And limitations. Hobbing techniques – climb and conventional, Gear shaping - Principle of operation, advantages, disadvantages, Gear finishing processes - Gear shaving , Gear grinding, Gear burnishing, gear lapping .	<b>06</b>	<b>16</b>
<b>04</b>	<b>Grinding</b> Classification of machines , Grinding wheel composition, types and shapes, Designation. Types of Grinding operations.	<b>02</b>	<b>06</b>
<b>05</b>	<b>Super Finishing Processes</b> 6.1 Honing, 6.2 Lapping, 6.3 Burnishing, 6.4 Buffing and polishing.	<b>02</b>	<b>06</b>
<b>06</b>	<b>Plastic Moulding</b> Types of plastic, Compression molding, Transfer moulding, Injection moulding, blow molding, vacuum forming, extrusion, calendaring, rotational moulding.	<b>04</b>	<b>08</b>
<b>Total</b>		<b>32</b>	<b>80</b>

## **Practical:**

**Note:** One hour of the practical per week is to be utilized for instructions by subject teacher to explain & demonstrate the accessories, tool holding & work holding devices as mentioned in practical contents. The student will write assignments based on these sessions.

Skills to be developed:

Intellectual skills:

1. Understand the axis identification of CNC lathe
2. Understand the various types of preparatory and miscellaneous codes.
3. Calculate machining time for different operations.
4. Identify cutting tool nomenclature / marking systems.
5. Know the significance of various super finishing methods.
6. Understand the different processes of gear cutting.
7. Understand various plastic molding methods.
8. Write programs for CNC Lathe.

Motor Skills:

1. Operate lathe, CNC lathe, drilling and milling machines.
2. Execute part programming.
3. Operate grinding machine.
4. Use the indexing mechanism.

## **List of Practical:**

- 1) One assignment on cutting tool nomenclature and tool signature of single point cutting tool.
- 2) Industrial visit to observe plastic processing shop and report on the visit.
- 3) One job on lathe containing the operations like plain turning, threading, boring, taper turning.
- 4) One job on CNC lathe containing the operations like plain turning, taper turning and curvature. (Group of two students , each group must use different program for different job dimensions )
- 5) One job containing drilling, milling, reaming, gear cutting (spur gear) per job max. two students.
- 6) One job containing surface grinding / cylindrical grinding for tolerances  $\pm 30$  micron,( For the job already made on milling machine /lathe).

- 7) One assignment on accessories & attachment – chucks, mandrels, carrier and catch plates rests, face plate and angle plate, grinding attachment used on lathe.
- 8) One assignment on accessories & attachment, work holding & tool holding devices used on milling machine.
- 9) One assignment each on shaper, planer, boring machine, broaching machine.
- 10) One assignment each on tool nomenclature & geometry of boring tool, broaching tool, milling cutters.
- 11) One assignment on types of grinding wheels.

### Learning Resources:

#### Books:

Sr. No.	Author	Title	Publisher
01	S. K. Hajra Chaudary, Bose, Roy	Elements of workshop Technology-Volume I & II	Media Promoters and Publishers Limited.
02	O. P. Khanna & Lal	Production Technology Volume- I & II	Dhanpat Rai Publications.
03	W. A. J. Chapman, S. J. Martin	Workshop Technology-Volume –I,II & III	Viva Books (p) Ltd.
04	O.P. Khanna	A text book of Foundry Tech.	Dhanpat Rai Publications.
05	R.B. Gupta	Production Technology	Satya Prakashan New Delhi
06	H.S.Bawa	Workshop Technology Volume-I& II	Tata McGraw-Hill
07	John A. Schey	Introduction to Manufacturing Processes	McGraw-Hill
08	M. Adithan A. B. Gupta	Manufacturing Technology	New age International
09	Pabla B. S. M. Adithan	CNC machines	New age international limited.
10	B. L. Juneja	Fundamental of metal cutting and machine tools	New age international limited.
11	Steve Krar, Albert Check	Technology of Machine Tools.	McGraw-Hill International.
12	P. N. Rao	CAD/CAM Principals and Applications	Tata McGraw-Hill
13	P. N. Rao	Manufacruting Technology Metal Cutting & Machne tools	Tata McGraw-Hill