



GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc), 1st Semester
Branch: Production Technology
Subject Name: Machine Tool Technology
Subject Code: 21110301

**With effective
from academic
year 2021-22**

Prerequisite: Zeal to learn the subject

Rationale: Manufacturing processes related to machining are included in this subject. All conventional manufacturing machines are included in this course to understand the basic concepts in machining science.

Teaching and Examination Scheme:

Teaching Scheme			Credit C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA(M)	ESE(V)	PA(I)	
3	0	0	3	50	0	0	0	50

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Content:

Sr. No.	Topic	No. of Hours	% Weightage
01	Basic Machine Tools: Machine tools classification, working and auxiliary motions in machine tools, Primary cutting motions in machines tools.	4	10
02	Metal Cutting Lathe The Lathe and its working Principle, Types, Different Parts of Lathe, Lathe Accessories and Attachments, Change of speed and Speed ratios. Feed Mechanism and change gears, Apron and Apron Mechanism. Specifications of Lathe. Lathe accessories: Chucks, Face plate, Angle plate, Driving plate, Lathe dogs, mandrels, Steady rest, Lathe attachments, Lathe operations: plane and step turning, Taper turning, Screw cutting, Drilling, Boring, reaming, Knurling, Parting off, Under cutting. Types of lathe tools and their uses, Brief description of semi automatic lathes such as capstan and turret lathes, their advantages and disadvantages over centre lathe, types of job done on them.	12	30
03	Drilling and Boring Machines: Drilling Machine: Purpose and field of application of drilling machines, Classifications of Drills, Twist drill, Twist drill parts and terminology. Types of drilling machines, Specifications of Drilling machines. Drilling and allied operation. Boring Machine: Purpose and field of application, Classification Boring Machines, Operations performed on Boring machines.	8	20



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04	<p>Milling Machines: Working Principles, Purpose and types of Milling machines, Size and specifications of Milling machines. Types of Milling machines, Different types of milling operations, milling cutters and attachments extending the processing capabilities.</p> <p>Milling operations like plane milling, space milling, angular milling form milling, straddle milling, gang milling, Negative rake milling, cutting speed and speed for different tools in up and down milling.</p> <p>Indexing or Dividing heads, milling of spur gears and racks.</p>	8	20
05	<p>Shaping, Planing & Slotting Machines: Classification of Shapers, Slotters, and Planer Machine, Attachments extending the processing capacities of Shapers, Slotters, and Planer, Different Parts and Tooling requirements. Working Principle and Mechanism.</p> <p>Differences and similarities among them, quick return mechanism applied to the machines.</p>	8	20

Distribution of marks weightage for cognitive level:

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	-	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

Students will be able to:

Sr. No.	CO statement	Marks % weightage
CO 1	Understand the basic concept of basic machine tools.	25
CO 2	To Understand the concept of metal cutting on Lathe	15
CO 3	To Understand and apply concept of drilling and boring machine.	20
CO 4	To understand the knowledge of milling and generate the sequence of machining operation to produce the end product.	20
CO 5	To understand the operation used in shaper, planner and slotter machines.	20

List of Open Source Software/learning website:

<https://nptel.ac.in>,

Reference Books

- Production Technology: Jain & Gupta
- Machine Tool Technology (Hindi): JK Kumar
- Workshop Technology Vol. II: Hazra & Choudhary
- A Text book of Production Engineering, by P C Sharma, S Chand Publication.