



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Vocation (B.Voc)

Semester: III

Branch: Production Technology

Subject Name: Machining and Machine Tools

Subject Code: 21130304

Type of course: Under Graduate

Prerequisite: None

Rationale: Students will be able to apply basics of metal machining processes very well. They can have enough knowledge of different forces acting while cutting with tool life and wear. They can interpret and utilize the economics of machining. Learns the technology of Gear and threads manufacturing which is grassroots knowledge of any manufacturing industries.

Teaching and Examination Scheme:

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

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Contents:

Sr. No.	Content	Teaching Hrs.	Module Weightage
01	Classification of Metal Removal Process: Principles of metal cutting, classification of Metal cutting/machining processes: Orthogonal and oblique cutting, Effect of tool geometry and other cutting parameters, Mechanisms of formation of chips, types of chips formed, chip Breakers, concept of specific cutting pressure.	8	20%
02	Mechanics of Metal Cutting: The forces acting on the cutting tool and their measurement, Merchant's circle diagram, force dynamometer, force and velocity relationship, Tool wear, Factors causing wear, tool life, variables affecting tool life, economical cutting speed, machinability of metals. General Purpose Machine Tools: tooling, attachments and operations performed, selection of cutting parameters, Simple calculation of time for machining.	12	30%
03	Special Purpose Machine Tools: Automatic lathes, capstan and turret lathe machines, Abrasive Processes: Abrasives, natural and synthetic, manufacturing,	12	30%



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	nomenclature, selection of grinding wheels, wheel mounting and dressing, characteristic terms used in grinding, machines for surface and cylindrical grinding, their constructional details and processes, surface finishing, honing, lapping, super finishing, polishing and buffing processes.		
04	Thread and Gear Manufacturing: Different types of Threads manufacturing methods, and tools involved, Different gear forming and generating methods with their special features, Gears finishing Processes.	8	20%
	Total	40	

Suggested Specification table with Marks (Theory):

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

R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO 1	Students will be able to apply basics of metal machining processes very well with the detailed signature of tools.	25
CO 2	To study economics of metal cutting.	25
CO 3	To study various special purpose machine tools.	25
CO 4	Students can able to grasp distinctive knowledge of gear and thread forming and its generating methods.	25

Reference Books:

1. Production technology by R.K.Jain
2. Production technology by P.C.Sharma
3. Elements of Workshop Technology Vol-II By Hazra Choudhury

List of Open Source Software/learning website:

1. www.nptel.ac.in