

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN MECHATRONICS ENGINEERING

SEMESTER: V

Subject Name: **Machine Tool Practices**

Laboratory Experiences:

Experience Type	Experience Number	Description of Laboratory Experience	Hours
Preperatory Activity (Includes Home Assignments)	1	a. Cutting speed, feed, depth of cut and Metal Removal Rate (MRR). b. Various cutting tools materials, properties and applications. c. Various carbide inserts and ISO codification. d. Calculate RPMs for Lathe, Milling cutter and drill spindle based on given data. Use equations. e. Calculate strokes/minute for shaping machine based on given data. Use equations. f. Basic machine tools processes	2
Demonstration And Study (Video / Movie May Be Used In Absence Of Machine Tools)	2	Kinematics and motion transmission of Cylindrical Grinding Machine.	8
	3	Kinematics and motion transmission of broaching Machine.	
	4	Kinematics and motion transmission of gear hobbing and gear shaping machine.	
	5	Constructional features of CNC.	
	6	Tool changing on CNC using Automatic Tool Changer.	
	7	Grinding various cutting tool angles on Tool and Cutter Grinding Machine.	
Visual Aids	8	Collect / Download product catalogues with specifications of various cutting tools including grinding wheels, gear hob cutter, gear shaping cutter, various milling cutters, reamers, broaches, etc.	2

	9	Collect / Download product catalogues with specifications of various machine tools of recent trends including CNCs.	
Job Preperation	10	Grind Single point cutting tool.	36
	11	Prepare a job on centre lathe as per the given drawing (Including plain turning, knurling, threading, boring and cylindrical grinding.)	
	12	Prepare composite job which includes turning, milling, drilling, shaping, boring, threading, slotting, grinding, etc...(Available all major operations). and prepare a report on process planning and route sheet with shop floor layout for given composite job.	
	13	Prepare a plain surface and inclined surface on shaping and surface grinding machine. Also predrill and tap minimum two holes.	
	14	Prepare a job having gear tooth cutting on milling machine using indexing head.	
	15	Prepare a multi start/square thread job-bolt and nut .	
Download, Seminar Presentation and Shop Talk (Copy Downloaded Content and Seminar of Whole Batch In One /One Set Of Cd/Dvd)	16	Download videos for non conventional machining methods and explain in group.	4
		Download videos for gear manufacturing methods, broaching, jig boring and explain in group.	
		Download videos/content on recent trends in metal removing technology and discuss with group.	
		On topic approved by batch faculty, prepare the Seminar. Also present the seminar at least for 10 minutes using Power point Presentation.	
Quiz Competition	17	Arrange quiz competition amongst batch students.	2

Live Learning	18	1. Prepare student for live learning. 2. Study activities through powerful observation. 3. Make them aware and to form a habit to learn at any place, any time , any thing & from any person. 4. Student will prepare a report of minimum 3 pages based on points 1 to 3 above of live learning in machining practice area.	2
Industrial/ Exhibition Visit	19	Visit at least three related industries and prepare a report. Also visit related exhibitions .	-
Assignments (Home Assignment)	20	Solve the given assignments. One assignment must be on preparation of chart / diagram / poster / graph / drawing / etc on half imperial size of drawing sheet.(For subject Machine Tools Technology)	-

Notes:

1. Term work report content of applicable experience should also include following.
 - a. Experience description / data and objectives.
 - b. Skill/s which is / are expected to be developed in student after completion of experience.
 - c. Drawing of experience / setup with labels/nomenclature to carry out the experience
 - d. The specifications of machines / equipments / devices / tools / instruments /items/elements which is / are used to carry out and to check experience.
 - e. Process parameters / setup settings' values applied to carry out experience.
 - f. Steps / Process description to execute experience.
 - g. Information on recent machines / equipments / devices / tools / instruments /items available in market to carry out the experience.
 - h. Special / Additional notes or remarks.
2. Term work report of student of regular mode should exclude Distance Learning manual, photocopies , printed content(except visual aids), etc. Focus should be on developing the term work as original efforts of students.
3. Term work content of industrial visit report should also include following.
 - a. Brief details of industry visited.
 - b. Type, location, products, rough layout, human resource, etc. of industry.

- c. Details, description and broad specifications of machineries/processes observed.
 - d. Safety norms and precautions observed.
 - e. Student's own observation on Industrial environment, culture and attitude.
 - f. Any other details / observations asked by accompanying faculty.
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- 4. Term work should also includes workshop log book and experience logbook duly certified by workshop instructors and subject teachers.
 - 5. Term work is to be defended (along with term work) with practical examination by external and internal examiners .Practical examination will include followings:
 - Viva
 - Job preparation of given drawing

Reference Books:

- 1. Machine tools technology, G. S. Kandaswami.
- 2. All about machine tools Gerling.
- 3. Machine tools B.Chennov.
- 4. Machine tool Vol.-I to IV Achercan.
- 5. Metal cutting technology & Experiments, K.G.Chaniramani
- 6. Engineering Productivity Vol.1 & 2, WFWalker.
- 7. Principles of Engineering Production, Lissamay & Martin.
- 8. Production Engineering Sciences, Dr. P. C. Pande & C. K. Singh.
- 9. Fundamental of Metal Machining and Machine Tools, Boothroyd.
- 10. The Art of Tool & Cutter Grinding, S. P. Narang.
- 11. Production Technology, HMT.