

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Fabrication Technology

Semester: 3

Subject Code

Subject Name Mechanical Technology

Sr. No.	Course content
1	INTRODUCTION TO MACHINE TOOLS : 1.1 Need, Scope & importance of machine tools in manufacturing industries 1.2 List of major mechanical machine tools industries in GUJARAT . 1.3 Need of attitude, Knowledge & skill required for shop floor supervisor in machine tool industries 1.4 Classification of machine tools 1.5 Mechanism of metal cutting & chip formation 1.6 Orthogonal & oblique cutting
2	LATHE MACHINE TOOL : 2.1 Introduction & specification 2.2 Construction & basic parts of lathe 2.3 Types of lathe 2.4 Lathe accessories & attachment 2.5 Lathe operation 2.6 Lathe cutting tools & Cutting tool material 2.7 Cutting speed, feed, D.O.C & M.R.R. 2.8 Cutting fluid 2.9 Safety in lath
3	DRILLING MACHINE TOOL : 3.1 Introduction & specification 3.2 Construction & basic Parts of Radial drilling machine tool, <u>Sensitive</u> drilling machine tool 3.4 Operations performed 3.5 Drill tool specification
4	SHAPPING & PLANNING TOOL : 4.1 Introduction & specification 4.2 Construction & basic parts 4.3 Operations performed
5	MILLING MACHINE TOOL : 5.1 Introduction & specifications 5.2 Construction & basic parts of horizontal & vertical milling m/c

	5.3 Types of milling machine 5.4 Milling cutters 5.5 Milling methods 5.6 Milling operations 5.7 Dividing head& Method of indexing 5.8 List of accessories & attachments
6	GRINDING MACHINE TOOLS : 6.1 Introduction & specifications 6.2 Construction & basic parts 6.3 Types of grinding machine 6.4 Grinding wheel-- Classification of grinding wheel, Marking system of grinding wheel 6.5 Truing, loading. Dressing , balancing self sharpening of grinding wheel
7	FOUNDRY : 7.1 Need, Scope & importance of foundry in manufacturing industries 7.2 List of major foundry industries in GUJARAT . 7.3 Need of attitude, Knowledge & skill required for shop floor supervisor in foundry 7.4 Steps involved in making a casting 7.5 Advantages & application of metal casting 7.6 Types of pattern & pattern material 7.7 Pattern allowances & color coding 7.8 Core & core marking 7.9 Types of cores 7.10 Types of sand & their properties 7.11 Mould & mould making 7.12 Types of mould & molding methods 7.13 Types of furnace--construction & basic parts of induction furnace & cupola 7.14 Charging of cupola 7.15 Pouring of metal 7.16 Fettling & finishing of casting 7.17 Defects in casting
8	MECHANICAL WORKING OF METALS : 8.1 Need, Scope & importance of mechanical working of methods in manufacturing industries 8.2 List of major mechanical working of methods industries in GUJARAT . 8.3 Need of attitude, Knowledge & skill required for shop floor supervisor in mechanical working of metal industry 8.4 Working principle, equipment, application, types, advantages & limitations of process: Rolling, Extrusions, Forging & spinning

LABORATORY EXPERIENCE :

Sr. No.	DESCRIPTION OF LABORATORY EXPERIENCE
1.	DEMONSTRATION & STUDY (REPORT / OBSERVATION WRITING) : <ol style="list-style-type: none">1. Study & Demonstration of lathe machine tools.2. Study of safety rules in industry.
2.	JOB PREPARATION (WRITE SEQUENCE AND PARAMETERS OF OPERATION) : <ol style="list-style-type: none">1. Job-1 covers the operations like facing, straight turning ,step turning, taper turning & thread cutting on lathe machine tool.2. Job-2 job on shaping machine tool.3. Job-3 job on drilling machine.4. Job-4 Demonstration & practice of milling machine & planning machine.5. Job-5 Demonstration & practice cutting by portable disc grinder.6. Job-6 Preparation of sand mould.
3.	SEMINAR & PRESENTATION & GROUP DISCUSSION : <ol style="list-style-type: none">1. Prepare a Seminar using Power Point Presentation / Transparencies on the topic covered in syllabus / beyond the syllabus2. Give 10 minutes presentation3. Group discussion
4.	PREPARATION OF MODELS , CHARTS QUIZ COMPETITION & SLOGANS (GROUP / INDIVIDUAL)
5.	INDUSTRIAL VISIT : Term work content of industrial visit report should also include following <ol style="list-style-type: none">a) brief detail of industry visitedb) Type, location, product, rough layout, human resource, etc of industry.c) Details, description and broads specification of machinery / process observed.d) Safety norms and precautions observede) Student on observation on industrial environment, culture and attitudef) Any other detail /observation asked by accompanying faculty. <ol style="list-style-type: none">1. Industrial visit of foundry.2. Industrial visit of mechanical working company.3. Industrial visit of machine tools company.
6.	SHEET & SKETCH WORK
7.	REPORT WRITING : <ol style="list-style-type: none">1. Write a report on milling machine – construction , types, specification & operation.2. Write a report on indexing mechanism & dividing head of milling machine3. Write a report on grinding wheel – classification & marking system of grinding wheel.4.

	5. Write a report on induction furnace & cupola 6. Write a report on importance of mechanical working methods in manufacturing industries
8.	BEYOND SYLLEBUS ACTIVITIES (DEVELOP CREATIVE & INNOVATIVE IDEAS AMONG STUDENTS) : Display Article, Information, Sketch, under Knowledge Zone(K-Zone), Inspiration Zone(I-Zone) & Creative zone(C-Zone)
9.	LITERATURE SURVEY : 1. Library Assignment 2. Internet Surfing 3. Refer Product Pamphlets 4. Technical Magazines
10	SHOP TALK : 10 minutes presentation on shop floor / laboratory during the preparation of job / laboratory experience by the students
11	AUDIO VISUAL AIDS : 1. Prepare Audio Cassette 2. Photograph Lab Manual 3. Technical Video Download
12	PAPER SOLUTION
13	SCHOOL WITHIN SCHOOL : 1.Guiding / Sharing /Mentoring the know-how by meritorious students to lower performing students.
14	SELF LEARNING : 1. Contact with field expert ,seniors, alumni and get further know-how individually or in a group. 2.Read related book/magazine/article/literature and share the content.

NOTES:

1. Term work report content of each experience should also include following.
 - a) Experience description/ data and objective.
 - b) A skill which is/are expected to be developed in student after competition of experience.
 - c) Drawing of experience / set up with labels / nomenclature to carry out the experience.
 - d) The specification of machine / equipment / devices / tools / instruments/items / elements which is / are used to carry out and to check experience.
 - e) Process parameters / set up settings values applied to carry out experience

- f) Steps / process description to execute the experience.
 - g) Observation
 - h) Information on resented machine / equipment / devices / tools/ instrument/ item available. In market to carry out the experience.
 - i) Special / additional notes or remarks.
2. Term work report of student of regular more should exclude distance learning manual, photocopy, printed content, etc. focus should be on developing the term work as original efforts of student.
 3. Term work content of industrial visit report should also include following
 - g) brief detail of industry visited
 - h) Type, location, product, rough layout, human resource, etc of industry.
 - i) Details, description and broads specification of machinery / process observed.
 - j) Safety norms and precautions observed
 - k) Student on observation on industrial environment, culture and attitude
 - l) Any other detail /observation asked by accompanying faculty.
 4. Term work also include experience logbook duly certified by subject teacher.

REFERENCE BOOKS:

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|--------------------------------------|-----|----------------|
| 1. Production technology vol – 1 & 2 | --- | O. P. Khanna |
| 2. Workshop Technology vol – 1 & 2 | --- | Hajra Chaudhri |
| 3. Manufacturing Technology | --- | P. N. Rao |
| 4. Foundry technology | --- | O. P. Khanna |
| 5. Production technology | --- | HMT |
| 6. Manufacturing Science | --- | S. Dalala |