

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD.

WORK - SHOP

1. RATIONALE :

Workshop practice is the backbone of the real industrial work situation, which helps in development and enhancement of relevant skills required by the technician working in engineering industries and workshops.

The workshop experiences would also help them to understand the complexity of industrial working in relative shorter duration of time. Moreover, the contents of these curricula form a basis and link for study of manufacturing processes and production technology courses in successive semesters.

The students are advised to undergo each skill experience with an understanding of know-how with special emphasis on know-why for the various instructions/practices imparted to them in each shop.

2. SCHEME OF TEACHING :

Sr. No.	TOPICS	Theory Hours	Practical Hours
1.	Introduction to workshop	—	02
2.	Fitting	—	16
3.	Smithy	—	08
4.	Tin Smithy	—	04
5.	Carpentary	—	12
6.	Pipe fitting	—	04
7.	Metal Joining	—	06
8.	Turning	—	04
Total Hrs		—	56

3. OBJECTIVES :

1. Comprehend the need of various sections in a workshop
2. Demonstrate observance of the safety consciousness and good housekeeping in a workshop
3. Follow the standard procedure for workshop practice.
4. Select and use appropriate materials for various sections of a workshop.
5. Use various tools, instruments and machines for different operations in fitting, smithy, carpentry, pipefitting and metal joining shop.
6. Prepare the required jobs correctly according to given specification in various sections of a workshop as mentioned in 5.
7. Demonstrate turning operations on lathe machine such as facing, centering, and taper turning.

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4. TOPICS AND SUB-TOPICS

TOPIC 1 : INTRODUCTION TO WORKSHOP

- 1.1 Workshop layout
- 1.2 Importance of various sections/shops of workshop
- 1.3 Type of jobs done in each shop
- 1.4 General safety rules and work-procedure of workshop

TOPIC 2 : FITTING

- 2.1 Fitting tools like - files vice, chisels, punch, scriber, hammers, surface plate, try squar, Callipers etc.
- 2.2 Fitting operations such as chipping, filing, scraping, grinding, sawing, marking, drilling, reaming, tapping.
- 2.3 Safety precautions.
- 2.4 Demonstration of various operations.
- 2.5 Preparation of male-female joints.

TOPIC 3 : SMITHY

- 3.1 Smithy tool like - hammer, tongs, anvil, flatner etc.
- 3.2 Smithy operations such as upsetting, drawing down, bending, setting down, welding, cutting, punching and fullering etc.
- 3.3 Safety precautions.
- 3.4 Demonstration of various smithy operations.

TOPIC 4 : TIN SMITHY

- 4.1 Tin smithy tools like - hammers, stakes, scissors etc.
- 4.2 Sheet metal operations such as shearing bending, joinining.
- 4.3 Safety precautions.
- 4.4 Demonstration of various operations.

TOPIC 5 : CARPENTARY

- 5.1 Carpentry tools like - saws, planner, chisels, hammers, pallet, marking gauge, vice, try square, rule etc.
- 5.2 Carpentry operations such as marking, sawing, planning, chiselling, grooving, boring, joining.
- 5.3 Types of woods and carpentry hardware.
- 5.4 Safety precautions.
- 5.5 Demonstration of various operations using hardware.

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TOPIC 6 : PIPE FITTING

- 6.1 Pipe fitting tools
- 6.2 Pipe fitting operations such as marking, cutting, bending, threading assembling, dismantling etc.
- 6.3 Types of various spanners such as flat, fix, ring, box, adjustable etc.
- 6.4 Safety precautions.
- 6.5 Demonstrations of various operations.

TOPIC 7 : METAL JOINING

- 7.1 Metal joining hand tools and equipment.
- 7.2 Metal joining temporary and permanent methods such as, screw, nuts bolts and washers, rivets, keys, pins and welding soldering brazing.
- 7.3 Demonstrations of metal joining operations.
- 7.4 Safety precautions.

TOPIC 8 : TURNING

- 8.1 Turning operations such as facing, centering and turning.
- 8.2 Demonstration of different Lathe parts and demonstration of above operations.

5. LIST OF EXERCISES

(1) FITTING

- * Prepare one job on marking, drilling filing and tapping generating different profiles such as pentagon, hexagon etc.
- * Prepare one job on male female fitting.

(2) SMITHY

- * Prepare one job on upsetting, drawing down, bending, joining, etc.

(3) TIN SMITHY

- * Prepare one job on sheet metal marking, shearing, flattening, bending and joining (with solder)

(4) CARPENTARY

- * Prepare one job on marking, planning, sawing, chiselling and joining.
- * Prepare one job on marking, sawing, planning, nailing and screwing using plywood/packing wood.

(5) PIPE FITTING

- * Prepare one job on pipe marking, cutting, threading and assembling. pipe fitting in a group of five students.

(6) WELDING

- * Prepare one job using arc welding.

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(7) TURNING

- * Demonstration of different parts of lathe demonstration of centering and turning operations in a group of 10 students.

NOTE :-

1. Work progress book should be maintained continuously.
2. Apron, Shoes etc. should be stressed for safety.

Sr. No.	Objective No.	Instructional Strategies
1.	1	<ul style="list-style-type: none">• Input on layout of workshop• Use suitable charts and sketches depicting layout of workshop• Workshop visit and discussion
2.	2	<ul style="list-style-type: none">• Input-cum-discussion/demonstration• Use suitable charts cutouts and sketches to show safe and unsafe practices• Video programme will be used to demonstrate safe practices, good and poor house keeping etc.
3.	3	<ul style="list-style-type: none">• Discussion on workshop practices, followed by demonstration.
4.	4	<ul style="list-style-type: none">• Input-cum-discussion• Use relevant I.S. Code.• Demonstration of commonly used materials in different sections of a workshop with their samples of different cross sections.
5.	5	<ul style="list-style-type: none">• Demonstration by the instructor• Hands-on experience with practice and feedback exercise will be provide to develop the skills in handling tools and equipment in various shops.
6.	6	<ul style="list-style-type: none">• Demonstrate a few jobs produced in different sections of a workshop.• Hands-on experience with practice and feedback exercises will be provided to produce a given job correctly.
7.	7	<ul style="list-style-type: none">• Demonstration

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6. REFERENCES :

Sr. No.	Name of Books	Authors
1.	Workshop Familiarization	E. Wilkinson
2.	Workshop Technology - I	Hazra and Choudhary
3.	Workshop Technology - I	W.A.J. Chapman
4.	Engineering industry Training Board Insruction Manual (i) Inspection & Measurements (ii) Mechanical Fitting	Engineering Industry Training Board
5.	I.T.B. Hand Book	Engnieering Industry Training Board
6.	Sheet metal shop practice	Bruce & Meyer
7.	Workshop Technology Vol. I & II	Gupta & Kaushik