



CO 7	2											
CO 8	2											

### Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	70	30	1 hour

**Assessment Procedure:** Total marks allotted for the course is 100 marks. CIE shall be conducted for 70 marks and ESE for 30 marks. CIE should be done for the work done by the student and also viva voce based on the work done on each practical session. ESE shall be evaluated by written examination of one hour duration conducted internally by the institute.

### Continuous Internal Evaluation Pattern:

Attendance	: 20 marks
Class work/ Assessment/Viva-voce	: 50 marks
End semester examination (Internally by college)	: 30 marks

**End Semester Examination Pattern:** Written Objective Examination of one hour

## SYLLABUS

### PART 1

#### CIVIL WORKSHOP

- Exercise 1. Calculate the area of a built-up space and a small parcel of land- Use standard measuring tape and digital distance measuring devices
- Exercise 2. (a) Use screw gauge and vernier calliper to measure the diameter of a steel rod and thickness of a flat bar
- (b) Transfer the level from one point to another using a water level
- (c) Set out a one room building with a given plan and measuring tape
- Exercise 3. Find the level difference between any two points using dumpy level
- Exercise 4. (a) Construct a  $1\frac{1}{2}$  thick brick wall of 50 cm height and 60 cm length using English bond. Use spirit level to assess the tilt of walls.
- (b) Estimate the number of different types of building blocks to construct this wall.

- Exercise 5. (a) Introduce the students to plumbing tools, different types of pipes, type of connections, traps, valves, fixtures and sanitary fittings.
- (b) Install a small rainwater harvesting installation in the campus

**Reference Books:**

1. Khanna P.N, "Indian Practical Civil Engineering Handbook", Engineers Publishers.
2. Kumar. S, "Building Construction", Standard Publishers.
3. Bhavikatti. S, "Surveying and Levelling (Volume 1)", I.K. International Publishing House
4. Arora S.P and Bindra S.P, " Building Construction", Dhanpat Rai Publications
5. S. C. Rangwala, "Engineering Materials," Charotar Publishing House, Anand, 1993

**PART II**

**MECHANICAL WORKSHOP**

**LIST OF EXERCISES**

(Minimum EIGHT units mandatory and FIVE models from Units 2 to 8 mandatory)

UNIT 1:- General : Introduction to workshop practice, Safety precautions, Shop floor ethics, Basic First Aid knowledge.

Study of mechanical tools, components and their applications: (a) Tools: screw drivers, spanners, Allen keys, cutting pliers etc and accessories (b) bearings, seals, O-rings, circlips, keys etc.

UNIT 2:- Carpentry : Understanding of carpentry tools

Minimum any one model

1. T-Lap joint
2. Cross lap joint
3. Dovetail joint
4. Mortise joints

UNIT 3:- Foundry : Understanding of foundry tools

Minimum any one model

1. Bench Molding
2. Floor Molding
3. Core making
4. Pattern making

UNIT 4: - Sheet Metal : Understanding of sheet metal working tools

Minimum any one model

1. Cylindrical shape
2. Conical shape
3. Prismatic shaped job from sheet metal

UNIT 5: - Fitting : Understanding of tools used for fitting

Minimum any one model

1. Square Joint
2. V- Joint
3. Male and female fitting

UNIT 6: - Plumbing : Understanding of plumbing tools, pipe joints

Any one exercise on joining of pipes making use of minimum three types of pipe joints

UNIT 7: - Smithy: Understanding of tools used for smithy.

Demonstrating the forge-ability of different materials (MS, Al, alloy steel and cast steels) in cold and hot states.

Observing the qualitative difference in the hardness of these materials

Minimum any one exercise on smithy

1. Square prism
2. Hexagonal headed bolt
3. Hexagonal prism
4. Octagonal prism

UNIT 8: -Welding: Understanding of welding equipments

Minimum any one welding practice

Making Joints using electric arc welding. bead formation in horizontal, vertical and over head positions

UNIT 9: - Assembly: Demonstration only

Disassembling and assembling of

1. Cylinder and piston assembly
2. Tail stock assembly
3. Bicycle
4. Pump or any other machine

UNIT 10: - Machines: Demonstration and applications of the following machines

Shaping and slotting machine; Milling machine; Grinding Machine; Lathe; Drilling Machine.

UNIT 11: - Modern manufacturing methods: Power tools, CNC machine tools, 3D printing, Glass cutting.

**Course Contents and Lecture Schedule:**

No	Topic	No of Sessions
1	<b>INTRODUCTION</b>	
1.1	Workshop practice, shop floor precautions, ethics and First Aid knowledge. Studies of mechanical tools, components and their applications: (a) Tools: screw drivers, spanners, Allen keys, cutting pliers etc and accessories (b) bearings, seals, O-rings, circlips, keys etc	1

2	<b>CARPENTRY</b>	
2.1	Understanding of carpentry tools and making minimum one model	2
3	<b>FOUNDRY</b>	
3.1	Understanding of foundry tools and making minimum one model	2
4	<b>SHEET METAL</b>	
4.1	Understanding of sheet metal working tools and making minimum one model	2
5	<b>FITTING</b>	
5.1	Understanding of fitting tools and making minimum one model	2
6	<b>PLUMBING</b>	
6.1	Understanding of pipe joints and plumbing tools and making minimum one model	2
7	<b>SMITHY</b>	
7.1	Understanding of smithy tools and making minimum one model	2
8	<b>WELDING</b>	
8.1	Understanding of welding equipments and making minimum one model	2
9	<b>ASSEMBLY</b>	
9.1	Demonstration of assembly and disassembling of multiple parts components	1
10	<b>MACHINES</b>	
10.1	Demonstration of various machines	1
11	<b>MODERN MANUFACTURING METHODS</b>	
11.1	Demonstrations of: power tools, CNC Machine tools, 3D printing, Glass cutting	1