

## 1. SALIENT FEATURES OF DIPLOMA PROGRAMME IN MECHANICAL ENGINEERING (FABRICATION TECHNOLOGY)

- 1) Name of the Programme : Diploma Programme in **Mechanical Engineering (Fabrication Technology)**
- 2) Duration of the Programme : Three years (Six Semesters)
- 3) Entry Qualification : Matriculation or equivalent as prescribed by State Board of Technical Education, **Haryana**
- 4) Intake : 40
- 5) Pattern of the Programme : Semester Pattern
- 6) Ratio between theory and Practical classes : 50 : 50 (Approx.)

7) Industrial Training:

Four weeks of industrial training is included after IV semester during summer vacation. Internal assessment out of 50 marks and external assessment out of another 50 marks will be added in 5<sup>th</sup> semester. Total marks allotted to industrial training will be 100.

Distribution of Marks:

- Daily diary and reports of training - 50 Marks
- Viva Voce (External) - 50 Marks

8) Ecology and Environment:

As per Govt. of India directives, a subject on Environmental Education has been incorporated in the scheme.

9) Entrepreneurship Development:

A subject on Entrepreneurship Development and Management has been incorporated in the scheme.

10) Student Centred Activities:

A provision of 5-6 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. Such activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.

## **2. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN MECHANICAL ENGINEERING (FABRICATION TECHNOLOGY)**

A number of job opportunities exist in the field of fabrication of pressure vessels, heat exchangers, shells, dished ends, agitators, dryers etc. Job opportunities for piping engineers, erection engineers, estimation engineers etc are ample in addition to starting one's own enterprise.

After successful completion of diploma in Mechanical Engineering (Fabrication Technology), employment avenues are available in following industrial sectors:

- Fabrication Industry (Quality Control Engineer)
- Automobile Industry (Production Engineer)
- Piping & Forging Industry (Supervisor)
- Shipping Yard (Fabrication Engineer)
- Small scale Industry (As an Entrepreneur)
- NDT firms (Inspection Engineer)
- Contracting firm (Site Supervisor)
- Plastic and Composite Industry (Supervisor)
- Process Industry (Erection Engineer)

### **3. COMPETENCY PROFILE OF A DIPLOMA HOLDER IN MECHANICAL ENGINEERING (FABRICATION TECHNOLOGY)**

Keeping in mind the employment opportunities, a diploma holder in Mechanical Engineering (Fabrication Technology) should possess following competencies:

1. Competency in preparing drawings and skills in reading and interpreting drawings.
2. Understanding about various forms, characteristics, testing, usage and standards of various types of materials used in Fabrication.
3. Well versed with various fabrication processes and related equipment.
4. Skills in making use of computers for different types of applications in the field of Fabrication Technology.
5. Knowledge and skills regarding various measuring instruments, process instrumentation, and inspection techniques.
6. Understanding regarding procedures for installation, erection, layout, testing and maintenance of machines/equipment.
7. Competencies in preparing material schedules, manpower schedules and process schedules.
8. Knowledge and skills in the operation and maintenance of various plant facilities like material handling equipment/machines, compressors, pumps, boilers and power generation equipment/machines.
9. Knowledge and skills to maintain suitable records of production and services, analyse operational efficiency and cause of waste and take remedial action.
10. Competencies in carrying out work study, knowledge of plant layout and material handling especially movement of material on the shop floor and understanding of various elements of production, planning and control and QC tools.
11. Competencies in problem solving in various functional areas, may it be prototype, development, diagnostic and faultfinding or repair and maintenance of plant and equipment.
12. Knowledge and skills in communication, interpersonal relations and basic skills in management.
13. Understanding regarding labour management and awareness regarding Laws and Acts related to labour welfare, safety and pollution control.

14. Appreciation regarding leadership, team building and coordinated functioning for achieving desired targets.
15. Continued learning skills for problem solving.
16. Competencies in conducting survey and collection of feedback data from customers/users regarding performance of products and preparation of test/survey reports, their analysis and presentation.
17. Knowledge and skills in applied sciences so as to develop scientific temper, and their applications in technology subjects and as a foundation for continued learning.

#### 4. DERIVING CURRICULUM AREAS FROM COMPETENCY PROFILE

| Sr. No. | Competency  | Curriculum Area   |
|---------|---|---|
| i)      | Competency in preparing drawings and skills in reading and interpreting drawings  | <ul style="list-style-type: none"> <li>▪ Engineering drawing</li> <li>▪ Machine drawing</li> </ul>  |
| ii)     | Understanding about various forms, characteristics, testing, usage and standards of various types of materials used in Fabrication industry.  | <ul style="list-style-type: none"> <li>▪ Materials and Metallurgy</li> </ul>  |
| iii)    | Well versed with various fabrication processes and related equipment.   | <ul style="list-style-type: none"> <li>▪ Workshop Technology</li> <li>▪ General Workshop Practice</li> <li>▪ CNC Machines and Automation</li> <li>▪ Fabrication Processes</li> <li>▪ Workshop Practice</li> </ul> |
| iv)     | Skills in making use of computers for different types of applications in the field of Fabrication Technology.   | <ul style="list-style-type: none"> <li>▪ Basics of Information Technology</li> <li>▪ CNC Machines and Automation</li> <li>▪ CIM</li> </ul>  |
| v)      | Knowledge and skills regarding various measuring instruments, process instrumentation, and inspection techniques.   | <ul style="list-style-type: none"> <li>▪ Inspection and Quality Control</li> </ul>  |
| vi)     | Understanding regarding procedures for installation, erection, layout, testing and maintenance of machines/equipment.   | <ul style="list-style-type: none"> <li>▪ Installation, testing and Maintenance</li> </ul>   |
| vii)    | Competencies in preparing material schedules, manpower schedules and process schedules.   | <ul style="list-style-type: none"> <li>▪ Industrial Engineering</li> </ul>  |
| viii)   | Knowledge and skills in the operation and maintenance of various plant facilities like material handling equipment/machines, compressors, pumps, boilers and power generation equipment/machines. | <ul style="list-style-type: none"> <li>▪ Thermodynamics</li> <li>▪ Industrial Engineering</li> </ul>  |
| ix)     | Knowledge and skills to maintain suitable records of production and services analyse operational efficiency and cause of waste and take remedial action.  | <ul style="list-style-type: none"> <li>▪ Industrial Engineering</li> </ul>  |

|       |  |   |
|-------|--|---|
| x)    | Competencies in carrying out work study, knowledge of plant layout and material handling especially movement of material on the shop floor and understanding of various elements of production, planning and control and QC tools. | <ul style="list-style-type: none"> <li>▪ Industrial Engineering</li> </ul>  |
| xi)   | Competencies in problem solving in various functional areas, may it be prototype, development, diagnostic and faultfinding or repair and maintenance of plant and equipment.   | <ul style="list-style-type: none"> <li>▪ Project Work</li> <li>▪ Industrial Training</li> </ul>                                 |
| xii)  | Knowledge and skills in communication, interpersonal relations and basic skills in management.   | <ul style="list-style-type: none"> <li>▪ Communication Skills</li> <li>▪ Entrepreneurship Development and Management</li> </ul> |
| xiii) | Understanding regarding labour management and awareness regarding Laws and Acts related to labour welfare, safety and pollution control.   | <ul style="list-style-type: none"> <li>▪ Entrepreneurship Development and Management</li> </ul>                                 |
| xiv)  | Appreciation regarding leadership, team building and coordinated functioning for achieving desired targets.  | <ul style="list-style-type: none"> <li>▪ Entrepreneurship Development and Management</li> </ul>                                 |
| xv)   | Continued learning skills for problem solving.   | <ul style="list-style-type: none"> <li>▪ Project Work</li> <li>▪ Student centred Activities</li> </ul>                          |
| xvi)  | Competencies in conducting survey and collection of feedback data from customers/users regarding performance of products and preparation of test/survey reports, their analysis and presentation.                                  | <ul style="list-style-type: none"> <li>▪ Entrepreneurship Development and Management</li> </ul>                                 |
| xvii) | Knowledge and skills in applied sciences so as to develop scientific temper, and their applications in technology subjects and as a foundation for continued learning.   | <ul style="list-style-type: none"> <li>▪ Applied Physics</li> <li>▪ Applied Chemistry</li> <li>▪ Applied Mathematics</li> </ul> |

## 5. ABSTRACT OF CURRICULUM AREAS

**Following is the abstract of curriculum areas:**

### 5.1 Applied Science

- Applied Mathematics
- Applied Physics
- Applied Chemistry
- Basics of Information Technology

### 5.2 Engineering Sciences

- Engineering Drawing
- Applied Mechanics
- Materials and Metallurgy
- Strength of Materials
- Basics of Electrical and Electronics Engineering
- Hydraulics and Pneumatic Systems
- Thermodynamics

### 5.3 Core Engineering/Technology

- Machine Drawing
- Theory of Machines
- Machine Design and Drawing
- Fabrication Processes
- Workshop Technology
- Inspection and Quality Control
- CNC Machines and Automation
- Computer Aided Manufacturing
- Industrial Engineering
- Installation, Testing and Maintenance
- Workshop Practice
- General Workshop Practice
- Industrial Training
- Project work

### 5.4 Management Subjects

- Communication Skills
- Employability Skills
- Environmental Education
- Entrepreneurship Development and Management

### 5.5 Student Centred Activities

It includes industrial visits, extension lectures, seminars, library studies, hobby clubs, sports and games and cultural activities.

## 6. HORIZONTAL AND VERTICAL ORGANISATION

| Sr. No. | Subject  | Distribution of time in various semesters |           |           |           |           |           |
|---------|--|---|-----------|-----------|-----------|-----------|-----------|
|         |  | I   | II        | III       | IV        | V         | VI        |
| 1.      | Communication Skills                             | 5   | 5         | -         | -         | -         | -         |
| 2.      | Applied Mathematics                              | 5   | 5         | -         | -         | -         | -         |
| 3.      | Applied Physics                                  | 6   | 6         | -         | -         | -         | -         |
| 4.      | Applied Chemistry                                | 5   | 5         | -         | -         | -         | -         |
| 5.      | Engineering Drawing                              | 6   | 6         | -         | -         | -         | -         |
| 6.      | General Workshop Practice                        | 6   | 6         | -         | -         | -         | -         |
| 7.      | Basics of Information Technology                 | 4   | -         | -         | -         | -         | -         |
| 8.      | Applied Mechanics                                | -   | 5         | -         | -         | -         | -         |
| 9.      | Basics of Electrical and Electronics Engineering | -   | -         | 5         | -         | -         | -         |
| 10.     | Workshop Technology                              | -   | -         | 3         | 3         | 3         | -         |
| 11.     | Workshop Practice                                | -   | -         | 9         | 9         | 9         | -         |
| 12.     | Machine Drawing                                  | -   | -         | 6         | -         | -         | -         |
| 13.     | Materials and Metallurgy                         | -   | -         | -         | 5         | -         | -         |
| 14.     | Hydraulics and Pneumatic Systems                 | -   | -         | -         | 6         | -         | -         |
| 15.     | Thermodynamics                                   | -   | -         | 6         | -         | -         | -         |
| 16.     | Strength of Materials                            | -   | -         | 6         | -         | -         | -         |
| 17.     | Fabrication Processes                            | -   | -         | -         | 5         | 6         | -         |
| 18.     | Inspection and Quality Control                   | -   | -         | -         | -         | -         | 6         |
| 19.     | Theory of Machines                               | -   | -         | -         | -         | 4         | -         |
| 20.     | Machine Design and Drawing                       | -   | -         | -         | 8         | -         | -         |
| 21.     | Computer Aided Manufacturing                     | -   | -         | -         | -         | 3         | -         |
| 22.     | Employability Skills                             | -   | -         | -         | -         | 2         | 2         |
| 23.     | Environmental Education                          | -   | -         | -         | -         | 3         | -         |
| 24.     | Industrial Engineering                           | -   | -         | -         | -         | -         | 4         |
| 25.     | CNC Machines and Automation                      | -   | -         | -         | -         | 5         | -         |
| 26.     | Entrepreneurship Development and Management      | -   | -         | -         | -         | -         | 3         |
| 27.     | Installation, Testing and maintenance            | -   | -         | -         | -         | -         | 7         |
| 28.     | Project Work                                     | -   | -         | -         | -         | -         | 12        |
| 29.     | Student Centered Activities                      | 3   | 2         | 5         | 4         | 5         | 6         |
|         | <b>Total</b>                                     | <b>40</b>                                 | <b>40</b> | <b>40</b> | <b>40</b> | <b>40</b> | <b>40</b> |