

## DIPLOMA PROGRAMME IN FIRE TECHNOLOGY AND SAFETY

### 1. SALIENT FEATURES

- (1) Name of the Programme : Diploma Programme in **Fire Technology and Safety**
- (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:**  
 A minimum duration of four weeks of industrial training is included after 4th semester during summer vacation. An Internal assessment out of 50 marks and an external assessment out of another 50 marks have been 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                           | - | 50 Marks |
- (8) **Ecology and Environment :**  
 As per directives of Government 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). **Personality Development**  
 A camp focusing on personality development of students has been incorporated in the fifth semester. There will be assessment under SCA.
- (11) **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 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 FIRE TECHNOLOGY AND SAFETY

It is observed that employment in government/public sector undertakings are dwindling day by day. Keeping present scenario in view following employment opportunities are visualized in different sectors of employment for diploma holders in **Fire Technology and Safety**.

### (1) *Manufacturing Industry (Mechanical)*

The diploma holder will be involved in following activities in mechanical manufacturing industry:

- Fabrication of Fire Tender, Rescue Tender, FCT (Foam Crash Tender) DET Tender Water Bouser

### (2) *Planning and Execution of Fire Tenders, Fire Equipments*

### (3) *Government Departments such as Electricity Board, MES, PWD, Railways, Air bases, Airports, Defence, Thermal, Hydro and Nuclear Power Stations and other Boards and Corporations*

The diploma holder in **Fire Technology and Safety** will be involved in following type of activities in above mentioned Government Departments:

Estimating fixed fire fighting installation, designing of fire equipment, fixed installation, smoke/heat fabrication of Fire Tender, FCT, Rescue Tender, Spl. Tenders, Detectors.

### (4) *Hospitals, Commercial Complexes, Service Sector Organizations like Hotels, Tourist-Resorts, high-rise buildings, Cinema/Theater Halls etc.*

The diploma holder in **Fire Technology and Safety** will be involved in following type of activities in above mentioned Service Sector Organizations:

- Smoke/Heat detectors and sprinklers fire fighting equipment system
- Preventive Maintenance of Communication System, Lifts, Air-Conditioning Plants and Water Supply System
- Inventory Management
- Estimation for fire safety equipment repair and maintenance work

**(5) Self Employment**

Following type of self employment opportunities are available to the diploma holder in **Fire Technology and Safety**

- Trading of Electrical/Fire safety devices and equipments
- Establishing Repair and Maintenance Unit/ Centre
- Contractor for Electrical and fire safety equipments
- Contractor for Fire safety installation
- Contractor for Estimation of loss during fire

Can work as: Annual maintenance of fire fighting equipments in shopping mall multistory buildings, hotels, hospitals.

- Service and marketing engineer in the field of automation.
- Fire Consultant

**(6) Job Profile/ Activity Profile**

- (i) Reading and interpreting drawings related to electrical machines, equipment, wiring installations, marking fire fighting arrangements of drawings of multistory buildings, shopping malls, hotels and hospitals
- (ii) Selecting right type and quality of fire fighting equipments
- (iii) Using measuring instruments, tools and testing devices for varied field applications
- (iv) Understanding of constructional details, principle of working, characteristics and application of electrical equipment, appliances and fire equipment
- (v) Understanding of practices involved in erection, testing/installation and commissioning of electrical equipment, control panels and systems including fire fighting equipment
- (vi) Troubleshooting of electrical wiring installations, fire equipment and control systems
- (vii) knowledge and awareness of: Indian Electricity Rules, Codes and Standards, Electrical Safety and Shock Prevention Measures, Labour Management,
- (viii) Understanding of safety practices such as earthing, fire and shock prevention measures adopted in industry and service sector
- (ix) Understanding the principles of basic and digital electronics, microprocessors and micro-controller based systems and their applications in electrical and fire safety circuits

- (x) Uses Information Technology and computers for various applications in the field of fire technology
- (xi) Knowledge and awareness of upcoming advance technologies like CAFS and Mist
- (xii) Good knowledge of aerial ladders with floater installation
- (xiii) Competencies in supervising work site operations
- (xiv) Knowledge of latest trends in the field of fire technology like DSPA system dry sprinkler powder

### 3. COMPETENCY PROFILE OF DIPLOMA HOLDER IN FIRE TECHNOLOGY AND SAFETY

Keeping in view the employment scenario and requirement of four domains of learning viz. Professional Development Domain, Continued Learning Domain, Human Relations Domain and Personal Development Domain, a diploma holder in **Fire Technology and Safety** should have the:

1. ability to read and interpret drawings related to wiring installations for light, power and fire protection systems
2. competency in selection of right kind and quality of materials, preparation of estimates for installation of fire fighting equipment and devices
3. ability to prepare tender document as per given drawings for fire safety installation and other fire related material and equipment
4. ability to use measuring instruments, tools and testing devices for varied field applications
5. competency in the design of control circuits for electrical wiring, fire circuits and circuits of smoke/heat detectors
6. understanding of practices involved in erection, testing/installation and commissioning of control panels, fire systems, pumps and other fire related equipment
7. ability for fault diagnosis and repair of electrical wiring, fire safety installations and equipment
8. knowledge and awareness of:
  - Indian Electricity Rules, Codes and Standards
  - Safety and Shock Prevention Measures
  - Technical Report-writing Skills
  - Team Working, Interpersonal Relations and Human Values
  - Entrepreneurship Development (Self Employment)
  - Concern for wastage
  - Energy Management and Auditing

9. understanding of safety practices such as earthing, fire and shock prevention measures to be adopted in industry and service sector
10. knowledge and awareness of various Rules and Acts related to area of Fire Technology and Safety such as :
  - Petroleum Act Rules
  - Calcium Carbide Act Rules
  - Cinematograph Act Rules
  - Explosive Act Rules
  - Fire Prevention Act
  - Fire Service Act
  - National Disaster Management Act
  - National Building Code – 2005 (part IV)
11. ability to use Information Technology and computers for various applications in the field of Fire Technology and Safety
12. knowledge of applied and engineering sciences for better comprehension of technologies used in fire technology and fire service in addition to develop scientific temper, analytical skills and to facilitate continuing education
13. understanding of fire manuals and competencies related to work site operations
14. proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work
15. competency in solving simple problems related to fire technology, fault finding or repair and maintenance of fire safety installation

16. competency in solving problems of rescue and fighting fire at fire ground
17. understanding of basic principles of managing men, material and equipment and techniques
18. awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques

#### 4. DERIVING CURRICULUM AREAS/SUBJECTS DERIVED FROM COMPETENCY PROFILE

Sr. No.	Competency Profile	Curriculum Areas / Subjects
1.	ability to read and interpret drawings related to wiring installations for light, power and fire protection systems	<ul style="list-style-type: none"> <li>- Engineering Drawing</li> <li>- Electrical Machines</li> <li>- Installation of Fire Systems</li> <li>- Fire Technology</li> </ul>
2.	competency in selection of right kind and quality of materials, preparation of estimates for installation of fire fighting equipment and devices	<ul style="list-style-type: none"> <li>- Electrical and Electronics Engineering materials</li> </ul>
3.	ability to prepare tender document as per given drawings for fire safety installation and other fire related material and equipment	<ul style="list-style-type: none"> <li>- Estimation and Costing</li> </ul>
4.	ability to use measuring instruments, tools and testing devices for varied field applications	<ul style="list-style-type: none"> <li>- Electrical and Electronic Instruments and Measurements</li> </ul>
5.	competency in the design of control circuits for electrical wiring, fire circuits and circuits of smoke/heat detectors	<ul style="list-style-type: none"> <li>- Design and Drawing of wiring and Control circuits</li> <li>- Electrical Workshop Practice</li> </ul>
6.	understanding of practices involved in erection, testing/installation and commissioning of control panels, fire systems, pumps and other fire related equipment	<ul style="list-style-type: none"> <li>- Erection, Commissioning and operation of Electrical Machines and Installations</li> </ul>
7.	ability for fault diagnosis and repair of electrical wiring, fire safety installations and equipment	<ul style="list-style-type: none"> <li>- Testing, repair and maintenance of Electrical Machines and Installations</li> </ul>
8.	knowledge and awareness of: <ul style="list-style-type: none"> <li>- Indian Electricity Rules, Codes and Standards</li> <li>- Safety and Shock Prevention Measures</li> <li>- Technical Report-writing Skills</li> <li>- Team Working, Interpersonal Relations and Human Values</li> <li>- Entrepreneurship Development (Self Employment)</li> <li>- Concern for wastage</li> <li>- Energy Management and Auditing</li> </ul>	<ul style="list-style-type: none"> <li>- Electrical Safety Measures</li> <li>- Communication Skills</li> <li>- Project Work</li> <li>- Employability Skills</li> <li>- Entrepreneurship Development and Management</li> </ul>

9.	understanding of safety practices such as earthing, fire and shock prevention measures to be adopted in industry and service sector	<ul style="list-style-type: none"> <li>- Electrical Workshop Practice</li> <li>- Science of Fire</li> <li>- Safety Rules and Acts</li> </ul>
10.	<p>knowledge and awareness of various Rules and Acts related to Fire Technology and Safety such as :</p> <ul style="list-style-type: none"> <li>- Petroleum Act Rules</li> <li>- Calcium Carbide Act Rules</li> <li>- Cinematograph Act Rules</li> <li>- Explosive Act Rules</li> <li>- Fire Prevention Act</li> <li>- Fire Service Act</li> <li>- National Disaster Management Act</li> <li>- National Building Code – 2005 (part IV)</li> </ul>	<ul style="list-style-type: none"> <li>- Fire Prevention</li> <li>- Investigation and Inspection of Fire</li> </ul>
11.	ability to use Information Technology and computers for various applications in the field of Fire Technology and Safety	<ul style="list-style-type: none"> <li>- Basics of Information Technology</li> <li>- Computer Programming and Applications</li> </ul>
12.	knowledge of applied and engineering sciences for better comprehension of technologies used in fire technology and fire service in addition to develop scientific temper, analytical skills and to facilitate continuing education	<ul style="list-style-type: none"> <li>- Applied Physics</li> <li>- Applied Chemistry</li> <li>- Applied Mathematics</li> <li>- Workshop Practice (Electrical and Mechanical)</li> </ul>
13.	understanding of fire manuals and competencies related to work site operations	<ul style="list-style-type: none"> <li>- Workshop Practice</li> <li>- Fire Safety</li> </ul>
14.	proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work	<ul style="list-style-type: none"> <li>- Communication Techniques/ Skills</li> <li>- Project Work</li> <li>- Exposure to World of Work</li> </ul>
15.	competency in solving simple problems related to fire technology, fault finding or repair and maintenance of fire safety installation	<ul style="list-style-type: none"> <li>- Repair and Maintenance of Electrical Installations</li> <li>- Electrical Engineering Drawing,</li> <li>- Estimation and Costing in Electrical Engineering</li> </ul>
16.	competency in solving problems of rescue and fighting fire at fire ground	<ul style="list-style-type: none"> <li>- Major Project Work</li> <li>- Physical Training and Drill</li> </ul>

17.	understanding of basic principles of managing men, material and equipment and techniques	- Entrepreneurship Development and Management
18.	awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques	- Environmental Education - Non-Conventional Sources of Energy

## **5. ABSTRACT OF CURRICULUM AREAS/SUBJECTS**

### **a) Basic Sciences and Humanities**

1. Communication Skills I & II
2. Employability Skills 1 & II
3. Entrepreneurship Development and Management
4. Environmental Education

### **b) Applied Sciences**

5. Applied Mathematics I & II
6. Applied Physics I & II
7. Applied Chemistry I & II

### **c) Basic Courses in Engineering/Technology**

8. Engineering Drawing I & II
9. General Workshop Practice
10. Basics of Information Technology

### **d) Applied Courses in Engineering/Technology**

11. Fundamentals of Electrical Engineering
12. Electrical and Electronics Engineering Materials
13. Science of Fire Technology
14. Basic Electronics
15. Fire Prevention
16. Computer Programming and Applications
17. Physical Training and Drill I, II, III & IV
18. Electrical and Electronics Engineering Materials
19. Electrical Machines
20. Electrical and Electronics Measuring Instruments
21. Fire Equipment and Machinery
22. Fire Tender and Pumps
23. Fire Service Administration
24. Investigation and Inspection of Fire
25. Major Project Work

## 6. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subjects	Time Distribution in Hours/week 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.	Basics of Information Technology	4	-	-	-	-	-
6.	Engineering Drawing	6	6	-	-	-	-
7.	General Workshop Practice	6	6		-	-	-
8.	Fundamentals of Electrical Engineering	-	6				-
9.	Electrical and Electronics Engineering Materials	-	-	4	-	-	-
10.	Basic Electronics	-	-	7	-	-	-
11.	Science of Fire Technology	-	-	6	-	-	-
12.	Fire Prevention	-	-	6	-	-	-
13.	Computer Programming and Applications	-	-	6	-	-	-
14.	Physical Training and Drill-I,II,III,IV	-	-	6	6	6	6
15.	Electrical Machines-I	-	-	-	7	-	-
16.	Electrical and Electronics Measuring Instruments	-	-	-	7	-	-
17.	Electronic Devices and Circuits		-	-	7	-	-
18.	Fire Equipment and Machinery	-	-	-	8	-	-
19.	Employability Skills – I, II	-	-	-	-	2	2
20.	Environmental Education	-	-	-	-	3	-
21.	Fire Tender and Pumps	-	-	-	-	4	-
22.	Fire Service Administration	-	-	-	-	-	8
23.	Investigation and Inspection of Fire	-	-	-	-	-	6
24.	Entrepreneurship Development and Management	-	-	-	-	-	3
25.	Major Project Work	-	-	-	-	-	10
26.	Student Centred Activities	3	1	5	5	5	5
<b>Total</b>		<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	*	<b>40</b>

\* There is 12 week Industrial/Practical Training of students during 5<sup>th</sup> Semester (Mid August to Mid November)