



## *Syllabus*

### ***Diploma in Fire Safety Management***

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**MANONMANIAM SUNDARANAR UNIVERSITY**  
**TIRUNELVELI**

The scheme shall be as follows

## **Diploma in Fire Safety Management**

### **Semester – I**

<b>S. No.</b>	<b>Title of the papers</b>	<b>Subject Code</b>	<b>Exam. Hours</b>	<b>Internal Marks</b>	<b>Uni. external Marks</b>	<b>Total Marks</b>
1	History of fire service	CFMT1	3	25	75	100
2	Fire Control Technology	CFMT2	3	25	75	100
3.	Practical	CFMP1		40	60	100

### **Semester – II**

<b>S. No.</b>	<b>Title of the papers</b>	<b>Subject Code</b>	<b>Exam Hours</b>	<b>Internal Marks</b>	<b>Uni. external Marks</b>	<b>Total Marks</b>
1.	Principles of Industrial Safety And Accident Prevention	CFMT3	3	25	75	100
2.	Hazard Control System	CFMT4	3	25	75	100
3.	Basic of Transmission, Suspension, Steering System & Brakes (Practical)	CFMP2		40	60	100
4.	Training Report, Project	CFMPT			100	100

### **On-the-Job Training:**

Project Report: 50 Marks

Viva-Voce : 50 Marks

**Eligibility: 10+2**

**Duration: 2 Semester (1 Year)**

**Minimum Pass Marks: 40%**

# *Syllabus*

## **Certificate in Fire Safety Management**

### **Semester – I**

#### **Paper I**

#### **History of fire service**

##### **UNIT –I**

###### Basic physics

- Units
- Force, resultant force
- Laws of force
- Laws of motion
- Mass and weight, work, power, energy
- Law of conservation of energy
- Friction

##### **UNIT –II**

###### Basic Chemistry and physics of fire

- Atomic structure
- Elements, compounds
- Pure substance and mixture
- Physical and chemical changes
- Condition for the changes
- Energy changes
- Effects of heat on matter
- Combustion
- Temperature
- Specific heat capacity
- Catalyst
- Neutralization
- Sublimation
- Heat of decomposing
- Chemical reaction
- Exothermic reaction and endothermic reaction
- Transmission of heat
- Flash and fire point
- Ignition temperature
- Flammables and combustible chemicals
- Spontaneous combustion
- Triangle of combustion
- Tetrahedron fire
- Spread of fire

##### **UNIT - III**

- Classification of fire
- General Causes of fire
- Detection of fire
- Extinguishing methods
- First aid fire fighting equipments
- Fire bucket, Fire beater, hose reel hose
- Portable extinguisher

- depends on weight
- depends on operating method
- depends on content
- depends on position of nozzle
- Construction
- Operation
- Maintenance
- Refilling

#### **UNIT - IV**

Fixed fire fighting installations using water

- Hydrant or fire water system
  - Classification of hydrant system
- Sprinkling system
- Major foam pourer system
- Steam drenching system
- Emulsification
- Special fires and fire fighting
  - Air craft fire
  - Ships fire

#### **UNIT - V**

Fixed fire fighting installations not using water

- Complete CO2 flooding system
- Complete DCP spraying system
- Complete Halon flooding system
- Investigation of fire
- Point, Time and cause of ignition
- Arson and detection of fires

## **Paper II**

# **FIRE CONTROL TECHNOLOGY**

### **UNIT -I**

#### **Hose**

- Types of hose
- Characteristic
- Frictional loss
- Material used
- Cause and prevention of mildew
- Causes and prevention of shock
- Causes and prevention of rubber acid
- Care and maintenance
- Types of hose fittings
- Couplings
- Component parts of inter locking couplings
- Suction coupling wrenches
- Branches, nozzles and branch holders
- Foam making branches
- Nozzles
- Collecting head and suction hose fittings
- Breechings
- Adapters
- Maintenance of hose fittings

### **UNIT -II**

#### **Rope, Lines, knots and ladders**

- Introduction
- Manufacturing materials
- Types of ropes and size
- Cordage
- Causes of deterioration of ropes and lines
- Different type of knots
- Different type of lines
- Purpose of knots
- Ladders
- Introduction
- Hook ladder, escape ladder, turn table and extension ladder
- Hook ladder belts

### **UNIT – III**

#### **SCBA and foam making equipments**

- Introduction
- Physiology of respiration
- Effects of respiration
- Essential fetchers of BA set
- Description and technical details
- Care and maintenance various BA sets
- Advantage and disadvantage of various BA set
- Foam & foam making equipments
- Definition
- Different type of foam concentrate
- Storage
- Characteristics
- Foam branch and its type

- Mechanical foam generator

## **UNIT -IV**

### **Pumps, primers, tenders and water relays**

- Introduction, definition
- Different types of pumps
- Different types of primers
- Working principle of various pumps primers
- Maintenance and trouble shooting
- Testing of pumps
- Advantages and disadvantages
- Water relay system
- Open circuit system
- Closed circuit system
- Different type of tenders and Fire alarm system
- Operation and maintenance of various tenders
- Water, foam, Co<sub>2</sub>, DCP and emergency tenders

## **UNIT -V**

### **Fire alarm**

- Introduction of Electronics and Electricity:-
  - Semi conductor Physics
  - Circuit Control And Protective Devices
  - Transistors
- Principles of fire detectors
- Parts of fire alarm unit
- Control panel
- Type of detectors
- Automatic fire detection
- Classification of detector
- Control and indicating equipment
- Trouble shooting and maintenance
- Intruder alarms

## **Semester – II**

### **Paper I**

#### **PRINCIPLES OF INDUSTRIAL SAFETY AND ACCIDENT PREVENTION**

##### **UNIT I**

- Introduction to Safety
- Goals, Need, History of Safety.
- Importance of Industrial Safety
- Accident Causation
- Definition
- Case study

##### **UNIT II**

- Theories and principles of accident Causation
- The effect of accident,
- Unsafe Act
- Unsafe condition,
- Unpredictable performance,
- Consequences of accident.
- Accident prevention programmes

##### **UNIT III**

- Cost analysis and Accident Prevention
- Direct accident, Indirect accident,
- Accident Prevention Methods
- Accident Investigation
- Accident Reporting
- Accident Investigation,
- Accident Investigation Report

##### **UNIT IV**

- Promotion Role
- Pre- accident Strategy and Health Policy
- Safety Department
- Safety Committee and Function
- House keeping and Importance
- Advantages of good house keeping
- Post Accident strategy
- First Aid
- Fire fighting
- Accident Investigation.
- Role of government, Management, workers and trade unions promoting safety in industry

##### **UNIT V**

- First Aid
- Introduction
- Body structure and functions
- Position of causality
- The unconscious casualty
- Fracture and dislocation
- Injuries to muscles and joints
- Resuscitation
- Bleeding
- Management of shock
- Burns, scalds and accidents caused by electricity
- Rescue and transport of casualty

## **Paper II**

# **HAZARD CONTROL SYSTEM**

### **UNIT I**

- Hazards
- Definition
- Glossary of Terms
- Hazards Control System
- System safety
- Job Hazard analysis
- Hazop
- Fault tree Analysis
- Failure mode and effect Analysis

### **UNIT II**

- Physical and chemical properties of hazardous materials
- Introduction
- Major industrial hazards
- Types and consequences of major industrial hazard
- Effects on human body
- Precautions while fire fighting
- Stages of combustion
- Hazards of combustion
- Stability and inflammability
- BLEVE
- Fire extinguishments

### **UNIT III**

- Flammable Solids, Liquids and Gas
- Petrochemicals and other hydrocarbons
- Tank fire – storage tank, trucks, service stations
- High pressure pipe lines
- Pressurized and liquefied gases
- Natural gas
- Petroleum gases
- Refrigerants etc.
- Acetylene
- Metals
- Non metals

### **UNIT IV**

- Other hazardous properties
- Harmful contamination of air and water
- Toxicity
- Corrosiveness
- Radioactive hazards
- Special precaution for handling
- Emergency preparedness
- Pesticides
- Explosion
- Deflagration and detonation of gas
- Dust explosion
- Confined and unconfined vapor cloud explosion



# PRACTICALS

## UNIT-I

- Drills
- Squad drill
- Hose drill
- Knots and lines
- Hydrant drill
- MTU drill
- Ladder drill
- Picking up drill

## UNIT-II

- Practical training
- First Aid Fire Fighting Equipments
- Breathing apparatus
- Hydraulic pressure testing
- Industrial exposure training

## Unit III

- Practical training
- Personal Protective equipment
- Fire alarm
- First aid
- Smoke chamber/confined space
- Industrial exposure training

## NOTE:

- Drills and practical training will continue through out the course according to unit wise.
- Industrial exposure training may conducts at various industries and organizations.