



## Course Name: Diploma in Fire Safety (DFS)

Duration: 1 Year

Eligibility: 10+2 or Equivalent

Lateral Entry: The candidate who has certificate in Fire Safety with 10+2 is eligible for Semester 2

### Semester I

Code	Subjects	Credits
DFS 101	Fire Tech & Design	5
DFS 102	Construction Safety	5
DFS103	Industrial Safety	5
DFS104	Environmental Safety	5
DFS105	Practicals	5

### Semester II

Code	Subjects	Credits
DFS201	Safety of People in the event of Fire	4
DFS202	Fire Risk Assessment	4
DFS203	Fundamental of Fire Engineering Science	4
DFS204	Fire Control Technology	4
DFS205	Fire Fighting Drills-I	4

## Detailed Syllabus

### Course: Diploma in Fire Safety

#### Semester: I

#### Fire Tech & Design (Code DFS 101)

#### Unit-I

Classification of fire, Portable fire extinguishers, Pumps and primers, Foam and foam making equipments

#### Unit-II

Hose and hose fittings, Water relay systems, Breathing apparatus, Small gears

#### Unit-III

Fire protective clothing, Ladders, Ropes and lines, bends & hitches, Fire prevention

#### Unit-IV



Special appliances, Fire fighting codes and standards, Electrical fire hazards, Structures under fire

## **Construction Safety (Code DFS 102)**

### **Unit-I**

Site planning and housekeeping, Types of Scaffolds, Scaffold Erection & dismantling, Scaffold Inspection

### **Unit-II**

Safety in scaffolding – an overview, Investigation of scaffold accident, Provisions on scaffold under the building other construction workers central rules, 1998, Safety in excavations, trenching and shoring

### **Unit-III**

Road work and pilling operation, Ladders, Use of safety nets and fall protection systems, Concrete and concert foams and shoring

### **Unit-IV**

Importance of civil work in construction industry, Material handling, Important safety requirements and inspections

## **Industrial Safety (Code DFS 103)**

### **Unit-I**

Fundamentals of industrial safety, Different types of industries, Different types of safety systems and equipments, Safety policy and safety terminology

### **Unit-II**

Work permit systems, Job safety analysis, Hazop study, Fault tree analysis

### **Unit-III**



Emergency planning, Safety inventory systems, Safety survey, Occupational health hazards, Safety organization and duties of a safety officer

#### **Unit-IV**

Accident prevention methods, Safety committee, Accident investigation, Safety management systems, Laws related to safety (Factories ACT 1948 Explosive ACT, Electricity ACT etc.)

### **Environmental Safety (Code DFS 104)**

#### **Unit I**

Air pollutants – Pollution sources - automobile pollution-hazards of air pollution-concept of clean coal combustion technology, fly ash-control of combustion in combustion chambers- ultra violet radiation, infrared radiation, radiation from sun-hazards due to depletion of ozone - deforestation ozone holes-automobile exhausts-chemical factory stack emissions - CFC

#### **Unit II**

Water pollutants-health hazards-sampling and analysis of water-water treatment - different industrial effluents and their treatment and disposal -advanced wastewater treatment - effluent quality standards and laws - chemical industries, tannery, textile effluents-common treatment.

#### **Unit III**

Hazardous waste management in India-waste identification, characterization and classification-technological options for collection, treatment and disposal of hazardous wastesselection charts for the treatment of different hazardous wastes-methods of collection and disposal of solid wastes-health hazards-toxic and radioactive wastes incineration and verification - hazards due to bio-process-dilution-standards and restrictions – recycling and reuse.

#### **Unit IV**

Sampling and analysis – dust monitor – gas analyzer, particle size analyzer – lux meter-pH meter – gas chromatograph – atomic absorption spectrometer, Gravitational settling chambers-cyclone separators-scrubbers electrostatic precipitator - bag filter – maintenance - control of gaseous emission by adsorption, absorption and combustion methods- Pollution Control Board-laws, Pollution control in process industries like cement, paper, petroleum-petroleum productstextile-tanneries-thermal power plants – dyeing and pigment industries – ecofriendly energy



## **Course: Diploma in Fire Safety Semester II**

### **Safety of People in the event of Fire (Code DFS 201)**

#### **Unit-I**

Recognition of possible fire sources and emergency procedures in the event of a fire, the course also offers an in-depth study of fire investigation and the construction techniques for eliminating fires, History of fires, types of detecting devices and extinguishing agents and systems, construction techniques, and fire investigation, National Fire Protection Association and Occupational Safety and Health Administration standards

#### **Unit-II**

Devising procedures in the event of fire, How people perceive and react to fire danger, The measures needed to overcome behavioural problems and to ensure the safe evacuation of people in the event of fire, Assisting disabled people to escape

#### **Unit-III**

Safety goals and objectives, Monitoring safety progress, Identifying hazards and risks, Safety and financial benefits, Safety and the balanced scorecard, Setting targets and ensuring commitment, Developing safe work systems, Policies and procedures, Safety values and principles

#### **Unit-IV**

Allocating responsibility and authority, Rehabilitation after an incident, Workplace inspections, Measuring and reporting, Developing and effective safety culture, Building an incident free workplace, Removing obstacles to safety, Safety and accountability, Developing safety habits in the workplace, Fire Protection and Analysis



## **Fire Risk Assessment (Code DFS 202)**

### **Unit-I**

Introduction, Understanding fire: How and why people die in fires , Human behaviour in fire: How people behave in emergencies, Legislative requirements: The Regulatory Reform (Fire Safety) Order 2005, Fire hazards & risks, Plan Drawing, Brief look at drawing to scale, and how plans can be used to good effect

### **Unit-II**

Fire risk assessment structure and layout, Means of escape principles: Basic requirements and what to look for, Fire signage: National requirements, Fire Alarms & fire detection: Basic components, and testing, Emergency lighting: When it is required, Basic components, and testing, Alternatives to emergency lighting

### **Unit-III**

Emergency Plans & Staff Training, Highly Flammables & LPG, Fire fighting equipment requirements, Fire resisting construction & compartmentation, Active fire safety for building protection: Sprinklers & Automatic roof vents

### **Unit-IV**

The process of fire risk assessment, Fire risk assessment recording and review procedures, The potential for pollution arising from fires, Measures to prevent and reduce fire pollution

## **Fundamental of fire engineering Science (Code DFS 203)**

### **Unit I**

History of fire service, Basic physics, Units, Guidelines for writing the units, Force, resultant force, Laws of force, Laws of motion, Mass and weight, work, power, energy, Law of conservation of energy, Mechanics – rest and motion, Distance and displacement, Speed and velocity, Acceleration, retardation, Acceleration due to gravity, Newton laws of motion, Machines and engines, Efficiency, 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

## **Fire Control Technology (Code DFS 204)**

### **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 10

### **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 relay, Introduction, definition, Deferent types of pumps, Deferent 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  
Detailed

### **Fire fighting Drills-I (DFS 205)**

