

Course Name: Certificate in Fire Safety (CFS)

Duration: 6 Months

Eligibility: 10th Standard or Equivalent**Semester 1**

Code	Subjects	Credits
CFS101	Fire Tech & Design	5
CFS102	Construction Safety	5
CFS103	Industrial Safety	5
CFS104	Environmental Safety	5
CFS105	Practicals	5

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 1

Same as Semester 1 of Certificate in Fire Safety

Semester 2

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

Semester: I

Course: Certificate in Fire Safety

Subject: Fire Tech & Design (CFS101)

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

Detailed Syllabus

Semester: I

Course: Certificate in Fire Safety

Subject: Construction Safety (CFS102)

Unit-I

Site planning and house keeping

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

Detailed Syllabus

Semester: I

Course: Certificate in Fire Safety

Subject: Industrial Safety (CFS103)

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.)

Semester: I

Course: Certificate in Fire Safety

Subject: Environmental Safety (CFS104)

Unit 1:

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 2:

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 3:

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 vitrification - hazards due to bio-process-dilution-standards and restrictions – recycling and reuse.

Unit 4:

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 – dying and pigment industries - eco-friendly energy.

Detailed Syllabus

Semester: I

Course: Diploma in Fire Safety

Subject: Fire Tech & Design (DFS101)

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

Semester: I

Course: Diploma in Fire Safety

Subject: Construction Safety (DFS102)

Unit-I

Site planning and house keeping

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

Semester: I

Course: Diploma in Fire Safety

Subject: Industrial Safety (DFS103)

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.)

Detailed Syllabus

Semester: I

Course: Diploma in Fire Safety

Subject: Environmental Safety (DFS104)

Unit 1:

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 2:

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 3:

Hazardous waste management in India-waste identification, characterization and classification-technological options for collection, treatment and disposal of hazardous wasteselection 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 4:

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 - eco-friendly energy.

Detailed Syllabus

Semester: II

Course: Diploma in Fire Safety

Subject: Safety of People in the event of Fire (DFS201)

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

Detailed Syllabus

Semester: II

Course: Diploma in Fire Safety

Subject: Fire Risk Assessment (DFS202)

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**

Detailed Syllabus

Semester: II

Course: Diploma in Fire Safety

Subject: Fundamental of fire engineering Science (DFS203)

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

Detailed Syllabus

Semester: II

Course: Diploma in Fire Safety

Subject: Fire Control Technology (DFS204)

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, Co2, DCP and emergency tenders

Detailed Syllabus

Semester: II

Course: Diploma in Fire Safety

Subject: Fire fighting Drills-I (DFS205)