# Diploma in Fire Service & Operations (DFSO)

**Eligibility – 10th  Duration -1 Year**

**Subjects:**

| Sr | Subject Name | Subject Code | Theory | Practical |
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| 1 | Fire Control Techniques | DFSO -01 | 80 | 20 |
| 2 | Fire Risk Assessment | DFSO-02 | 80 | 20 |
| 3 | Industrial Safety | DFSO-03 | 80 | 20 |
| 4 | Fire Engineering Science | DFSO-04 | 80 | 20 |
| 5 | Fire Fighting Drills | DFSO-05 | 80 | 20 |
| 6 | First AID | DFSO-06 | 80 | 20 |
| 7 | Practical & Viva | DFSO-07 | 80 | 20 |

# Detailed Syllabus

| 1 | Fire Control Techniques | DFSO -01 | 32 Hrs |
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**Unit I** **(08 Hours)**

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 II** **(10 Hours)**

Hose, Types of hose, Characteristic, Frictional lose, 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 III** **(08 Hours)**

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

**Unit IV** **(06 Hours)**

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

| 2 | Fire Risk Assessment | DFSO-02 | 28 Hrs |
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**Unit-I** **(06 Hours)**

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** **(04 Hours)**

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

**Unit-III** **(08 Hours)**

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-IV** **(10 Hours)**

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

| 3 | Industrial Safety | DFSO-03 | 24 Hrs |
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**Unit-I** **(06 Hours)**

Basics of industrial safety, various types of industries, Understanding the types of safety systems and equipments, Safety policy and safety terminology

**Unit-II** **(06 Hours)**

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

**Unit-III** **(06 Hours)**

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

**Unit-IV** **(06 Hours)**

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

| 4 | Fire Engineering Science | DFSO-04 | 36 Hrs |
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**Unit I** **(08 Hours)**

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** **(10 Hours)**

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** **(08 Hours)**

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 IV** **(10 Hours)**

Classification of fire, General Causes of fire, Detection of fire, Extinguishing methods, First aid fire fighting equipments, Fire bucket, Fire beater, hose real hose, Portable extinguisher, depends on weight, depends on operating method, depends on content, Depends on position of nozzle, Construction, Operation, Maintenance, Refilling

| 5 | Fire Fighting Drills | DFSO-05 | 38 Hrs |
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**Unit I** **(04 Hours)**

Drill I : Water CO2 Extinguisher Drill 9L · Drill II :Chemical Foam Extinguishing 9 L · Drill III :Mechanical Foam Extinguisher 9L · Drill IV :Stored Pressure Water Extinguisher 9 L · Drill V :Dry Chemical Powder 5 Kg · Drill VI :Dry Chemical Powder 10 Kg · Drill VII : ABC Extinguisher 5 Kg/ 10 Kg · Drill VIII : CO2 Extinguisher 4.5 Kg

**Unit II** **(10 Hours)**

Drill – I : Hose pick up Drill · Drill – II : Hose Running Drill with one hose · Drill – III : Hose Running with two hose · Drill – IV : Hose Running with Three hose

**Unit III** **(12 Hours)**

Hydrant Drill I : Opening of single line of three hoses. · Hydrant Drill II : Change of burst hose · Hydrant Drill III : Increase one length hose · Hydrant Drill IV : Decrease one length hose · Hydrant Drill V : Use of Collecting, breaching · Hydrant Drill VI : Disconnect collecting breaching · Hydrant Drill VII : Use of Dividing Breaching · Hydrant Drill VIII : Disconnect of Dividing Breaching Techniques to Handle various branches.

**Unit IV** **(10 Hours)**

Drill I : Pitching of ladder · Drill II : Climbing the ladder · Drill III : Use leg Lock · Drill IV : Ladder Drill with Fireman Lift · Drill V : L2 Drill Familiarization and Demonstration of Parts of BA Set. Drill I : Donning, running and Rescue of casualty through tunnel

**Unit V** **(02 Hours)**

Information and study First Aid Box · Stretcher Drill · Fireman Lift Drill · Use Bandage · Standard drills on Ambulance, Techniques of CPR, Fireman lift, CPR drill, Choking, Shaffer's Method, Rescue drill, Mouth to Mouth Respiration.

| 6 | First AID | DFSO-06 | 40 Hrs |
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**Unit –I** **(06 Hours)**

Definition of First-Aid, Qualities of first aider, Shock-Signs and Symptoms, Asphyxia-Signs and Symptoms, Wounds and Hemorrhage -Classification of injuries, Signs, Symptoms and management, Burns, Scalds and frost Bits signs and symptoms and management. Causes and types of fractures Sprain & Dislocation-Signs and symptoms, Snake Bite-Treatment.

**Unit II** **(06 Hours)**

Automatic Fire Detection cum Alarm System: Introduction of Types of Detectors- Smoke, Heat, Flame/Gas Detectors, Operating principles, Control Panel.

**Unit III** **(06 Hours)**

Introduction, Importance of Discipline, General Principles of discipline, essentials for discipline and outward Signs, Hazard and Risk: Causes, Identification, Evaluation & Control. HAZOP, Sources for Information on Hazard Evaluation. Risk and Risk Analysis.

**Unit IV** **(10 Hours)**

Accident : Industrial Accidents, Classification of Accidents, Need for the Analysis of Accidents, Accidents Reports, Methods Adopted for Reducing Accidents, Investigation of Accidents, Safety Slogans, Safety Precautions adopted in the Plant

**Unit V** **(12 Hours)**

Health – Cleanness, Disposal of Waste , Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & urinals, Safety - Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offer, Washing facilities in Dry clothing, Storing, Sitting, First Aid Appliances, Canteen, Shelters for rest & lunch, Crèches, Welfare officers, Right & Obligation of workers, Lighting, Ventilation & Work related stress: Introduction to Lighting, Ventilation, Heat Stress, Cold Stress, Noise

| 7 | Practical & Viva | DFSO-07 | 30 Hrs |
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