

**DETAILED CURRICULA**  
**Advanced Diploma in Fire Safety Management**

**2<sup>nd</sup> SEMESTER**

**Theoretical Papers**

**FSM – 201: Industrial Safety Management**

		Marks	Hours	
			Th	Tu
		<b>100</b>	<b>50</b>	<b>10</b>
<b>Group A</b>	<b>Safety Philosophy</b>			
	Definition of safety and meaning of safety awareness, Need for safety – Legal, Humanitarian, Economic. Safety and productivity; Factor impeding safety, Theories of accident occurrence, Principles of accident prevention. Physical, Physiological and psychological factor in safety.			
<b>Group B</b>	<b>Safety Organisations</b>			
	Objectives, Safety policy – An overview of safety policies for discovering cause of accidents and controlling them. Division of responsibilities in the organization. Training for safety, Employee's participation in safety, Financial aspect of safety.			
<b>Group C</b>	<b>Safety in Construction</b>			
	Safety Works – Excavation Gas Cutting, Welding, etc. All Precautionary Measures to be taken for work; Housekeeping; Different Types of Construction Activities and the Safety Measures including Working in Height; Prevention of Accidents/Fire; Knowledge of Productivity by Eliminating Hazards, Tool Box Meeting.			
<b>Group D</b>	<b>Occupational Health</b>			
	Meaning of occupational health and occupational health hazards. Common work related or occupational diseases – occupations involving risk of contracting these diseases – Cause of disease and its effect. Diagnostic method – Methods of Prevention – compensation for occupational diseases – Evaluation of injuries – Medical services in an industrial establishment and its functions – Occupational hazards in hospital – Action programme for work related diseases at the national level. Personal protecting equipments (PPE) – Introduction, Requirement and assessment of PPE, Types of PPE, Respiratory and nonrespiratory personal protective devices.			

**FSM – 202: Fire & Industrial Safety Management & Administration**

		Marks	Hours	
			Th	Tu

		100	50	10
<b>Group A</b>	<b>Safety Management</b>			
	Safety organization & Hierarchy, Managing safety in integrated manner with Environment & health, Role, responsibility & authority of Safety personnel, Safety policy, objectives & action plan, Risk & opportunity in safety functions, Competency requirement of Safety personnel, Competency assessment & Gap findings, Training need identification, Training calendar, Training effectiveness measurement, Monitoring of safety performance by Daily Safety pulse, Safety audit, Management Review			
<b>Group B</b>	<b>Safety Administration</b>			
	Consultation & communication in Safety, employee involvement in Safety, Engaging HEART & MIND of employees, Emergency preparedness & response, Mock drill of all safety emergency situations, Key clauses of ISO45001 standards, Few best practices in safety – LOTO practice, RACI chart, Tool box talk, Safety tree of incidents, Green Cross board etc.			
<b>Group C</b>	<b>Fire Service Management</b>			
	Role of Management in Fire Safety; Planning for Fire Safety; Management by Objectives and its Role in Safety, Health and Environment (SHE); Organising for Safety, Health and Environment; Coordination of three Components of SHE; Line and Staff Functions for SHE; Directing for Fire Safety; Human factors contributing to accidents; Human Factor Engineering; Behaviour based safety; Leadership of a Fire Officer in Fire Ground; Decision Making and Sharing.			
<b>Group D</b>	<b>Fire Service Ground Operation and Administration</b>			
	<p>Fire Service Organization. Executive Duties of Officer-in-Charge of a Fire Station.</p> <p>Administrative Duties of Officer-in-Charge of a Station (a) Writing of a Report (b) Occurrence Book, (c) Hose Card/Register, (d) Fire Reports, (e) Workshop Orders, (f) Log Books, (g) Stock Registers, (h) Orderly Room Registers, (i) Defaulter Register, (j) Leave Register, Station Discipline.</p> <p>Command and Control in the Fire Ground. Fire – Strategy and Tactics. Fire Ground Safety. Qualities of a Fireman. Duties of Fireman at Station Level and Fire Ground. Training and Practices.</p>			

**FSM – 203: Fire Prevention & Life Safety**

		Marks	Hours	
			Th	Tu
		100	50	10
<b>Group A</b>	<b>Means of Egress</b>			

	Factors Influencing in Designing Means of Egress, Occupancy; Construction; Travel Distance; Exit Requirement; Time of Evacuation; Model Means of Escape in Different Classes of Building; Structural Fire Safety; Building Design Safety.		
<b>Group B</b>	<b>Fire &amp; Evacuation Drill</b>		
	Purposes of Conducting Fire Drill; Formulation of Fire Drill; Instruction, Training and Practice for Conducting Fire Drill; Procedure for Conducting Fire Drill; Fire Notice/Fire Order; Recording and Documentation of the Drill.		
<b>Group C</b>	<b>Various Rescue Techniques</b>		
	Rescue Technique from Lift, Sewer, Collapsed Building, Motor Vehicle Accident, Well and River; Special Equipment and Training Requirements for Rescue Operations.		
<b>Group D</b>	<b>First Aid &amp; Resuscitation</b>		
	Definition of First-Aid; Qualities of First Aider; Shock; Asphyxia; Wounds and Hemorrhage; Burns, Scalds and Frost Bits; Causes and Types of Fractures; Sprain and Dislocation.		

**FSM – 204: Risk Assessment & Safety Audit**

		<b>Marks</b>	<b>Hours</b>	
			<b>Th</b>	<b>Tu</b>
		<b>100</b>	<b>50</b>	<b>10</b>
<b>Group A</b>	<b>Risk Assessment</b>			
	Risk & Hazard, Causes, Identification, Evaluation & Control, Fundamentals of Probability Science and Mathematical Model; Reliability Engineering; Resilience Engineering; Risk Assessment and Risk Analysis - Aims & Objectives, Process of Risk assessment, HAZOP and HAZAN, Sources for Information on Hazard Evaluation, Study of MSDS, Important Risk Factors of the Building.			
<b>Group B</b>	<b>Safety Audit</b>			
	Aims & Objectives; Process of Fire & Safety Audit, Preparation of Checklist for Fire & Safety Audit, Data Collection & Analysis, Preparation of Fire & Safety Audit Report.  <b>Fire Investigation:</b> Fire Fighters' Role in Fire Investigation; Areas of Operation; Initial Observation; Site Investigation; Detection of Arson; Probable Equipment for Detection of Fire Accelerant; Care on Handling of Physical Evidences.  <b>Salvage:</b> Salvage Operation and Difficulties Encountered; Equipment for Operation; Methods of Salvage Operation.			
<b>Group C</b>	<b>Emergency Management Plan</b>			
	<b>Emergency Plan:</b> Preparedness for Emergency Plan; Use of Various Agencies; Incident Command System (ICS); Responsibility Matrix.			

Group D	Routine Inspection and Reporting		
	Daily/Weekly/Monthly/Yearly Checking Procedure; Requirement and Frequency of Fire Safety Inspection; Model Survey Procedure for Different Categories of Buildings; Checklist for Survey and Inspection Procedure for Different Categories of Buildings; Reporting and Documentation.		

**FSM – 205: Design Engineering and Drawing of Fire Protection System**

		Marks	Hours	
			Th	Tu
		100	50	10
<b>Group A</b>	<b>Basic Principles of Drawing</b>			
	Study of Civil & Architectural Drawing; Study of Single-Storeyed Building; Study of More than Single-Storeyed Building; Study of Plan Drawing of Different Types of Building; Appreciation of CAD Drawings on Fire Protection of Different Buildings.			
<b>Group B</b>	<b>Design Basis with Schematic Diagram of Fire Protection &amp; Detection System</b>			
	Fire Detection Alarm System (For Conventional/Addressable System); Fire Hydrant System; Automatic Sprinkler System; MVWS System (for Cable vault/Cable gallery, Conveyor belt protection, Closed/Floating roof tanks, LPG bullets/sphere); HVWS System for transformer protection.			
<b>Group C</b>	<b>Foam Based Protection System</b>			
	Fixed, Mobile, Semifixed and Portable Foam Protection System and Limiting Factors; Foam Generating Methods; Uses and Limitations, Foam Installations; Environmental Considerations; Schematic Diagram of Fixed / Semi Fixed Foam System.			
<b>Group D</b>	<b>Chemical Based Fire Protection System</b>			
	<p><b>Carbon Dioxide Based Fire Protection System:</b> Methods of Application; Design Quantity, Leakage Path and Ventilation; Requirement of Carbon Dioxide and Rate of Application; Types of Application.</p> <p><b>Halon Alternatives Clean Agent Suppression System:</b> Type of System; Detection, Actuation, Alarm and Control System; Relevant Specification, Codes, Practices on the Agent and Suppression System; Schematic Diagram of Gas Based System.</p> <p><b>Dry Chemical Powder Based Fire Protection System:</b> Methods of Application; System Design Considerations; Storage, Actuating Mechanism and Distribution System; Rate of Application; Inspection, Testing and Maintenance of the System.</p>			

**FSM – 206: Fire & Industrial Safety Management Legislation**

		Marks	Hours
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			Th	Tu
		100	50	10
<b>Group A</b>	<b>Fire &amp; Industrial Safety Acts &amp; Rules</b>			
	Fire Service Act and Rules; Corporation and Municipality Act Related to Fire and Life Safety; Factory Act; Disaster Management Act; Petroleum Act - OISD; Explosive Rules; Cinematograph Act; Gas Cylinder Rules; Electrical Rules and Act; Hazardous Chemical Rules; SMPV Rule; Indian Standard Specifications Related to Fire & Industrial Safety.			
<b>Group B</b>	<b>NBC of India Part 4</b>			
	Introduction of NBC of India Part 4 – Fire and Life Safety, Classification of building in the country, building materials and their behavior under fire conditions, signs of collapse of building, various types of occupancies and firefighting techniques, importance of fire escapes with respect to their positioning, fire construction and provisioning of firefighting measures.			
<b>Group C</b>	<b>Fire Safety Standards</b>			
	<b>International Fire Safety Standards:</b> Various International Fire Safety Standards.  <b>Indian Standard Specification:</b> Various Equipments Used with Fire Services; Fire Extinguishers of Different Categories; Fixed Fire Fighting Installations; Fire Detection and Alarm System; Smoke Ventilation System; Air Conditioning & Venting System; Fire Appliances; Rescue and Special Gears, NBC of India Part 4; IS Codes.			
<b>Group D</b>	<b>Fire Safety Policy &amp; Guidelines</b>			
	International and National Policy for Fire Safety; Various International and National Guidelines for Fire Safety – PAS.			

## Sessional Papers

## FSM – 207: Practical/Field Training

	Marks	Hours
	200	100
1. Emergency Methods of Rescue: Inspection, testing and maintenance procedure of different firefighting and rescue gears and equipment. Proper use and method of operation of special firefighting and rescue gears used during emergency. Demonstration of the rescue methods from different locations, disaster response practices, IRS/JRT and salvage techniques including proper use of ladder, knots and hitches. Demonstration of the rescue operations associated with different dangerous chemicals, dust, gases, mist, vapours etc.		
2. First Aid and Resuscitation: First aid, methods of artificial respiration.		
3. Special Appliances and Equipment – Handling and Operation.		

<p>Analyzing different fire situations and firefighting.</p> <p>4. Water Relay: Demonstration of the concept of hydraulics in workplace.</p> <p>5. Fireman's Lift and Carry.</p> <p>6. Emergency Evacuation Drill Practice: Practice of Mock fire drill wearing BA Set and protecting clothings using different fire and rescue gears. Conducting fire and evacuation drill in different types of occupancies following guidelines as specified in NBC part 4. Fire drill in smoke chamber using BA set.</p> <p>7. Command and Control Procedure at Fire. Demonstration of hazard evaluation and risk analysis.</p> <p>8. Methods of Room Searching.</p> <p>9. Lowering Casualties from Height. Demonstration of the safety precautions while working at height, confined places and work permit system. Demonstration of emergency method of rescue including rescue from height, casualty handling, etc.</p> <p>10. Examining building construction and occupancy to ensure fire and life safety.</p> <p>11. Training to the occupiers of high risk building related to fire and life safety.</p> <p>12. Demonstration of Live firefighting in different situations.</p> <p>13. Live firefighting demonstration from open water using different hose and gears.</p> <p>14. Analyzing the concept of accident cause and prevention, accident investigation, analysis and safety management.</p> <p>15. Plan and execute fire station administration. Implement provisions related to safety, health and welfare in respect of Factory Act.</p>		
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**FSM – 208: Internship**

Marks	Hours
200	250

Study on Plant/Building Layout, Storage and Process Details, Fire Risk Analysis, Fire & Industrial Safety Management, Contingent Planning, Fire and Life Safety Systems including Preparation of Project Report of Any One of the Following:

1. Chemical Plant.
2. Thermal Power Station.
3. Refinery/Petrochemical Industry.
4. Airport.
5. Jute/Cotton Mill.
6. Iron & Steel Plant.
7. Manufacturing Industry.
8. Others.