

DIPLOMA IN FIRE AND SAFETY MANAGEMENT

SYLLABUS

SCHEME OF EXAMINATION

Subject code	Title of the Course	Hours	Passing Minimum
Semester I			
Subject 1	Safety Management	3 Hours	40/100
Subject 2	Basics of Fire fighting and Control	3 Hours	40/100
Subject 3	First Aid	3 Hours	40/100
Subject 4	Communicative English	3 Hours	40/100
Subject 5	Practical I-General First aid and Fire Fighting Equipment's-Operations and Repairing	3 Hours	40/100
Semester II			
Subject 1	Management and Risk Assessment	3 Hours	40/100
Subject 2	Chemical and Oil Industries Safety Management	3 Hours	40/100
Subject 3	Life Skill	3 Hours	40/100
Subject 4	Personality Development	3 Hours	40/100
Subject 5	Practical II-Fire Fighting Drills - Solids and Liquids	3 Hours	40/100
Semester III			
Subject 1	House Keeping	3 Hours	40/100
Subject 2	Construction Safety Management	3 Hours	40/100
Subject 3	Marine Fire Fighting	3 Hours	40/100
Subject 4	Practical III-Fire Fighting Drills - Electrical and Gases	3 Hours	40/100
Subject 5	Internship	3 Hours	40/100
Semester IV			
Subject 1	Fire Accident Prevention	3 Hours	40/100
Subject 2	Environmental Fire Safety	3 Hours	40/100
Subject 3	Aircraft Fire Fighting	3 Hours	40/100
Subject 4	Practical IV-Evacuation and Rescue Procedure	3 Hours	40/100
Subject 5	Project	3 Hours	40/100

Eligibility for admission: Pass in 10thstd examination conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamil Nadu or any other equivalent examination.

Examination: Passing Minimum for each Course is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the Courses and as given below:

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|-------------------------|----------------|
| 40 % but less than 50 % | - Third class |
| 50 % but less than 60 % | - Second class |
| 60 % and above | - First class |

Theory Paper

Internal Marks-25

External Marks-75

Syllabus

Semester I

- | | |
|------------|---|
| Course I | - Safety Management |
| Course II | - Basics of Fire fighting and Control |
| Course III | - First Aid |
| Course IV | - Communicative English |
| Course V | - Practical I-General First aid and
Fire Fighting Equipment's - Operations and Repairing |

Semester II

- | | |
|-------------|--|
| Course VI | - Management and Risk Assessment |
| Course VII | - Chemical and Oil Industries Safety Management |
| Course VIII | - Life Skill |
| Course IX | - Personality Development |
| Course X | - Practical II-Fire Fighting Drills - Solids and Liquids |

Semester III

- | | |
|-------------|---|
| Course XI | - House Keeping |
| Course XII | - Construction Safety Management |
| Course XIII | - Marine Fire Fighting |
| Course XIV | - Practical III-Fire Fighting Drills - Electrical and Gases |
| Course XV | - Internship |

Semester IV

- | | |
|--------------|--|
| Course XVI | - Fire Accident Prevention |
| Course XVII | - Environmental Fire Safety |
| Course XVIII | - Aircraft Fire Fighting |
| Course XIX | - Practical IV-Evacuation and Rescue Procedure |
| Course XX | - Project |

PROGRAM OBJECTIVE

- 1- To reduce the risk to life caused by fire.
 - 2- To reduce the risk of damage caused by fire and the environment.
 - 3- To prevent the occurrence of fire and explosion
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SEMESTER I
COURSE I
SAFETY MANAGEMENT

OBJECTIVE:

- To know about safety management system.
- To study workplace precautions.
- To identify safety and health training.

Unit I

18 Hrs

Key elements of a safety Management, Policy & commitment, Planning, Implementation and Operation, Measuring Performance, Auditing and Reviewing performance Initial Safety Management System Review, Safety Management System - Developing a workplace Safety and Health Policy.

Unit II

18 Hrs

Safety and Health Management System records: Operational Control – Workplace Precautions, Safety And Health training and Competence Training for Safety and Health.

Unit III

18 Hrs

Identify Training Needs – Organizational Needs, job-related Needs, Individual Needs : Identify Training Objectives and Methods, Deliver Training , Evaluation and feedback, specialist Advice and Services – access to Specialist advice and services, relationships within the Organization , relationships Outside the organization , external specialist safety and safety support.

UNIT - IV

18 Hrs

Stages in plant life and unsafe condition in factories, maintenance & safety, basics safety programming, safety department, Rules and regulation of safety department.

UNIT - V

18 Hrs

Responsibility of management for safety in plant, safe is guarding the public, Responsibility of government, social organization and public authorities. Safety activities of the ILO (International Labour Organization)

OUTCOME:

- 1- Understand Responsibility of government.
- 2- Receive idea on Rules and regulation of safety department.
- 3- Learn job-related Needs.

COURSE II
BASICS OF FIRE FIGHTING AND CONTROL

OBJECTIVE:

- To find out types of detecting devices.
- To know about Hose and hose fittings.
- To study, Fire protective clothing.

Unit-I

18 Hrs

History of fires, types of detecting devices and extinguishing agents and systems, construction techniques, and fire investigation.

Unit-II

18 Hrs

Classification of fire, different fire extinguishing methods, Portable fire extinguishers, Pumps and primers, Foam and foam making equipments. Hose and hose fittings, Water relay systems, types of detecting devices and extinguishing agents.

Unit-III

18 Hrs

Breathing apparatus, Small gears, Fire protective clothing, Ladders, Ropes and lines, bends & hitches, Fire prevention, Special appliances, Fire fighting codes and standards, Electrical fire hazards, Structures under fire.

Unit-IV

18 Hrs

Safety of People in the event of Fire, Recognition of possible fire sources and emergency procedures in the event of a fire,

Unit- V

18 Hrs

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.

OUTCOME:

- 1- Receive idea on Safety of People in the event of Fire.
- 2- Understand Assisting disabled people to escape.
- 3- Learn Structures under fire.

COURSE III

FIRST AID

OBJECTIVE:

- To know about surface causalities
- To study synthetic fibre rope
- To understand knots for making loops

Unit I

18 Hrs

Introduction – Search and Rescue – Stages of Rescue – Surface Causalities – Searching slightly damaged buildings- Exploration of likely survival points – selected debris removal – searching methods – Physical search – canine search – Technical search – Hailing search method – Diagrammatic representation of hailing search method – Advantages of hailing search – precaution during search and rescue.

Unit II

18 Hrs

Ropes and Knots – Ropes – Natural Fibre Rope – Synthetic Fibre Rope – Synthetic Fibre Rope – Nylon Rope – Poly Rope – Braided Synthetic Rope – Knots – Knots at the end of a ropes – knots for joining two Ropes – Knots for making Loops – Hitches.

Unit III

18 Hrs

Search and rescue methods – water rescue – Emergency rescue – Staircase Drag Method – Firemen crawl method – Search and rescue kit – Action plan for Transport of injured Person – Reporting – Action on the recommendations – Accident / Incident Report Form.

Unit IV

18 Hrs

Evacuation – Evacuation signal – Participatory Rural Appraisal – Resources – Resource Mapping – Social Mapping – Processes for Resources Mapping – Emergency Evacuation – Emergency situation

Unit V

18 Hrs

First aid – Principles and practice of first aid – Scope of first aid – The general principal of first aid – Types of Bleeding – shock – Treatment for electric shock, asphyxiation (suffocation) and drowning – Type of shock – Fracture –Burn – Transportation – Resuscitation Chart (CPR) – First Aid Kit – Basics of Backpacking First Aid – Equipment – PPE (Personal Protective Equipment) – Contents of First Aid Box.

OUTCOME:

1. Understand scope of first aid
2. Receive idea on emergency evacuation
3. Learn treatment for electric shock

COURSE IV

COMMUNICATIVE ENGLISH

1. Basic Grammar:

- a. Review of grammar
- b. Remedial study of grammar
- c. Simple sentence
- d. Word passive voice etc.

2. Bubbling Vocabulary:

- a. Synonyms
- b. Antonyms
- c. One – work Institution

3. Reading and Understanding English

- a. Comprehension passage
- b. Précis – writing
- c. Developing a story from hints.

4. Writing English

- a. Writing Business letters.
- b. Paragraph writing
- c. Essay writing
- d. Dialogue writing

5. Speaking English

- a. Expressions used under different circumstances
- b. Phonetics

COURSE V
PRACTICAL I
GENERAL FIRST AID and FIRE FIGHTING
EQUIPMENTS - OPERATIONS AND REPAIRING

List of Exercises

- List of Fire fighting equipments
- Understanding and Identification of the utility of different fire fighting equipments
- Procedure for operating different fire fighting equipments
- Identifying and using the right equipment on different categories of fire
- Mechanism of functioning of the different fire fighting equipments
- Maintenance of different fire fighting equipments
- Repairing the different fire fighting equipments

SEMESTER II

COURSE VI

MANAGEMENT AND RISK ASSESSMENT

OBJECTIVE:

- To know about managerial function
- To find out purpose of organizing
- To identify informational roles

Unit -I

18 Hrs

Introduction – Management- Definition – Nature – Scope & Functions – Significance of Management – Technical Skills –Human skill – Conceptual skills – Managerial roles – Interpersonal roles, informational roles, Decisional roles – Managerial functions- Planning – Organizing – Staffing – Leading – Controlling.

Unit II

18 Hrs

Planning – nature & Purpose of planning – Objectives – Strategies – Policies – Planning premises – Decision making – Organizing – Nature and purpose of organizing – line / staff authority & decentralization – effective organizing – organization culture – staffing – general principles – importance and technique

Unit – III

18 Hrs

Leading – leadership – defining –element of leadership – leadership behaviour and styles – creativity & Innovation – motivation and motivators – special motivation techniques – communication – communication function in organization – communication process – barriers and breakdowns in communication – effective communication

Unit IV

18 Hrs

Risk assessment – Risk Assessment method – Hazard – Hazard symbols – Hazard Analysis – Hazard Ranking – Risk Management – Definitions – Functions of Risk Management – Safety Management – Need concept – Terms Related with safety Management – safety officer – supervisor – safety committees- Role of Trade union – Role of Trade union – Role of workers – safety and the law

Unit V

18 Hrs

Disaster Management – Natural disaster- Cyclone – Tremor – storm – tropical cyclone – flood – Earthquake – landslide and avalanches – Nuclear and radiation accident – bio logical hazards.

OUTCOME:

1. Understand nature disaster
2. Develop role of workers
3. Learn effective communication

COURSE VII
CHEMICAL AND OIL INDUSTRIES SAFETY
MANAGEMENT

OBJECTIVE:

- To identify major oil industry accidents
- To find out the precaution and prevention for safety management
- To study about the fire hazards.

Unit I

18 Hrs

Review of Industry Accidents: Major Oil Industry Accidents, Major Chemical Industry Accidents, the Mexico LPG Disaster, Bhopal Disaster, Phillips Disaster.

Unit II

18 Hrs

Classification of chemicals, Safety in chemical industry, Criteria for layout of chemical plants, Instrumentation for safe plant operations. Control, precautions and prevention, specific safety measures for chemical industry.

Unit III

18 Hrs

Safety Precautions for transporting hazardous / toxic / flammable / explosive/ radioactive chemicals by all modes, transfer of chemicals by pipelines within and outside installations, above and under ground

Unit IV

18 Hrs

The fire hazards, risks and controls available for safe containment of oil and hydrocarbons offshore and onshore, Outline the hazards, risks and controls relating to hydrocarbon Process Safety Management (PSM) in the oil industries,

Unit V

18 Hrs

Control measures to minimize the effects of fire and explosion in the oil and gas industries, the principles, procedures and resources for effective emergency response

OUTCOMES

1. Understand the resources for effective emergency response
2. Receive idea on safety management in oil industry
3. Learn risk and control to hydro carbon process

COURSE VIII

Life Skill

I Life Coping or adjustment

- (a) External and internal influence in one's life
- (b) Process of coping or adjustment
- (c) Coping with physical change and sexuality
- (d) Coping with stress, shyness, fear, anger far live and criticism.

II Attitude

- (a) Attitude
- (b) Self acceptance, self – esteem and self actualization
- (c) Positive thinking

III Problem Solving

- (a) Goal Setting
- (b) Decision Making
- (c) Time Management and stress Management.

IV Computers

- (a) Introduction to Computers
- (b) M.S.Office
- (c) Power Point

V Internet

- (a) Introduction to internet
- (b) E – mail
- (c) Browsing

COURSE IX

PERSONALITY DEVELOPMENT

OBJECTIVE:

- To study about personality development
- To know about theories of personality development
- To identify the personality traits of individual

Unit I

18 Hrs

Introduction to Personality Development: Personality meaning, Importance, Factors influence- Heredity, Environment and Situations, Impact of individuals personality

Unit II

18 Hrs

Basic personality types, Theories of Personality, Need and its impact in personality, Maslow's hierarchy of needs, McClelland theory, Two factor theory, Jung theory.

Unit III

18 Hrs

Basic Personality Traits, Values, Beliefs, Interactions, Experiences, Environmental influences, The big five dimensions

Unit IV

18 Hrs

Developing the Personality, stages of development, Freudian stages of development, Erik Erickson's stages of development, Knowing own personality strengths and weaknesses, Being able to identify other people's personality traits, Using at home, career and relationships

Unit V

18 Hrs

Personality and Career Choice: Matching career and personality, Changing the Personality, Being yourself, being adaptable, Positive attitude, Individuality, Controlling emotions

OUTCOME:

1. Understand positive attitude of individual
2. Learn Freudian stages of development
3. Receive idea on personality and career choice

COURSE X
PRACTICAL II
FIRE FIGHTING DRILLS - SOLIDS AND LIQUIDS

List of Exercises

- To be conducted under strict supervision of the expert
- Conduct table talk drill initially by explain the pros and cons of each category of fire
- Ask for the suitable fire fighting equipments for the fire to be created and discuss on the operation procedure
- Identify a safe location for conduction Fire drill
- Create different category of fire at different time zone
- Make the participant involve in the process of fire fighting
- Reflect on the performance of the fire fighter
- Document the process and its outcome.

SEMESTER III
COURSE XI
HOUSE KEEPING

OBJECTIVE:

- To know about role and responsibility of house keeping
- To find out housekeeping procedure
- To study work in housekeeping department

Unit I

18 Hrs

Housekeeping its need and importance in maintaining a safe environment, Relationship between Safety and Housekeeping, Housekeeping department and its role and responsibility, Housekeeping organization chart, Positions and job descriptions in housekeeping department.

Unit II

18 Hrs

Housekeeping Procedures, Briefing and Debriefing, Indenting from stores, Inventory of Housekeeping Items, House keeping control desk, Importance, Role, Co-ordination, check list, key control, Handling Lost and Found

Unit III

18 Hrs

Planning the work in housekeeping department, Maintenance of security safety and caring out first and fire fighting methods, Area inventory, Frequency schedule, Performance standard, Productivity standard, Supply and equipment inventory level.

Unit IV

18 Hrs

Housekeeping standard building, Various standard set up, Staffing and training employees, Motivating employees.

Unit V

18 Hrs

Maintenance of records and stocks, ability to maintain and fill all records and stocks, Deviation identification, new work design. Ensure security and safety environment in the institutions

OUTCOME:

1. Understand new work design in housekeeping
2. Receive idea on motivating employees
3. Learn frequency schedule in housekeeping

COURSE XII
CONSTRUCTION SAFETY MANAGEMENT

OBJECTIVE:

- To study about classification of building
- To understand the material handling equipment
- To find out pilling operation

Unit I

18 Hrs

Civil – Civil work drawing – building drawing – Mechanical – Electrical works – construction material – concrete – concrete form and shoring – Classification of buildings – National Building Code (NBC) – Road work – pilling operation – Demolition – Asbestos and other fibers – Paints & Coating.

Unit II

18 Hrs

Hand tools and power tools – Environment and working places – Safety nets – Welding – Cutting and brazing- Material Handling equipment – Electrical and Compressed gas operations- Confined spaces- Hydrostatic pressure testing.

Unit III

18 Hrs

Safety in scaffoldings- overview – Terminology of scaffold – Scaffolding components – Scaffolds construction material

Unit IV

18 Hrs

Type of Scaffolds – design Scaffold – Scaffold erection & dismantling – diagrams of Scaffolds – ladders – Scaffold inspection – Lockout / Tagout – Scaffold tag – material handling – Investigation of Scaffold accident – safety while working on fragile roofs.

Unit V

18 Hrs

Fundamentals of safety – job safety analysis – safety audit – safety survey – Accident Investigation – Work permit system – Emergency planning – industrial lighting and ventilation – personal protective equipment – Safety and fire hazard in chemical industries – petroleum industries – Oil refinery – Fires in petrol filling station and garages – Motor vehicle fire – Explosives act 1884 – Fire Insurance

OUTCOME:

1. Understand job safety analysis
2. Learn investigation of scaffold accident
3. Understand through types of scaffold\

COURSE XIII
MARINE FIRE FIGHTING

OBJECTIVE:

- To study about classification of building
- To understand the material handling equipment
- To find out pilling operation

Unit I

18 Hrs

Marine Environment: Tides, Currents, Weather, Vessel Traffic, Channels & Navigation, Mooring Lines, Bottom Conditions, Piers & Wharves and Magnitude.

Unit II

18 Hrs

Problems Associated with Marine Fire fighting: Hazardous Materials, Hazards, Confined Space, Pollution Considerations, Language Problems, Vessel Movement, Limited Access, Personnel Safety, and Access and Egress.

Unit III

18 Hrs

Vessel Familiarization Personnel, Shipboard Documentation: Ship Arrangement Diagrams; Fire Plan, Dangerous Cargo, Cargo Loading Manual, and Crew/Passenger List,

Unit IV

18 Hrs

General ship Systems and procedures of the ship, Construction Materials of ship, General Vessel Layout, Doors and hatches, Escape tunnels, Ventilation systems, Mechanical operations

Unit V

18 Hrs

Safety system of the vessel: Fire Detection Systems, Suppression Systems, and Gas Detection Systems. Protection of Dangerous Cargo, Protection of Cargo, Protection of non-affected areas

OUTCOME:

1. Understand about the general ship system and procedure of the ship
2. Knowledge about the fire detection system
3. Learn about the suppression system

**COURSE XIV
PRACTICAL III**

FIRE FIGHTING DRILLS - ELECTRICAL AND GASES

**COURSE XV
INTERNSHIP**

- The students of this course are required to take up Internship training during the third semester and submit a report at the end of the semester but before the commencement of the end semester examination.
- The Objective of the internship is to understand the day to day activities of the organization in which the internship is undertaken and intensive training should be provided in all the departments of the organization.
- The period of the internship can be decided the centres concerned according to the availability of the training opportunities available. The choices could be either the internship can be on a daily basis in the afternoon or evening throughout the semester or for a period of one month after completion of the classes, before the examinations

SEMESTER IV
COURSE XVI
FIRE ACCIDENT PREVENTION

OBJECTIVES

- To understand the fire protective clothing
- To know about the fire prevention
- To find out the fire protection system

Unit I

18 Hrs

Fire Protective clothing – breathing apparatus – Small gears and lighting – Safety devices and special tools – Rubber gloves – Safety belts – Leather protective gloves – Hand lines – ladders – Ropes – Hand Tools.

Unit II

18 Hrs

Fire Prevention – Activities of National Fire Protection Association (NFPA) – International Fire Marshals Association (IFMA) –Fire administration and organization.

Unit III

18 Hrs

Fire protection system design: Hydrant system – Sprinkler system – water spray – drencher system – riser system – foam system – non water based system – automatic fire detection system.

Unit IV

18 Hrs

Principals of safety in storage – safety in the transfer of chemical – Solids – Liquids – Gases –safety tips in liquid unloading –Storage and handling of chemicals – Fire safety plan – Personal Safety.

Unit V

18 Hrs

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.

OUTCOME:

1. Understand the responsibilities and authority of allocating
2. Learn about the measuring and reporting
3. Understand about safety principles of transfer the chemical

COURSE XVII
ENVIRONMENTAL FIRE SAFETY

OBJECTIVES

- To understand the environmental fire risk
- To know about the environmental hazards classification and assessment
- To find out the building fire causes

Unit I

18 Hrs

Environmental fire Risk and Vulnerability Analysis, Risk : Its concept and analysis, Risk Reduction, Vulnerability : Its concept and analysis, Strategic Development for Vulnerability Reduction

Unit II

18 Hrs

Environmental Hazard classification and assessment, Environmental Hazard evaluation and control

Unit III

18 Hrs

Building fire Causes, effects and practical examples, coal fire Causes, effects and practical examples, forest fire Causes, effects and practical examples, oil fire Causes, effects and practical examples.

Unit IV

18 Hrs

The sources of pollution in the event of fire, preplanning to minimise the environmental impact of fire, pollution incident response plan.

Unit V

18 Hrs

The legal obligations related to environmental protection in the event of fire, the procedures for management, practical examples/video files.

OUTCOME:

1. Understand the legal obligation related to environmental protection
2. Learn about fire protection
3. Understand the pollution incident response plan

COURSE XVIII

AIRCRAFT FIRE FIGHTING

OBJECTIVES

- To understand the qualification of aircraft rescue
- To know about the fire fighter safety
- To knowledge about the communicating critical incident information to an airport

Unit I

18 Hrs

Introductions, Qualifications for Aircraft Rescue and Fire Fighting Personnel (ARFF), Airport Familiarization, Aircraft Familiarization, Airport Layouts.

Unit II

18 Hrs

ARFF Fire Fighter Safety, Aircraft Hazards, ARFF Communications: Communicating critical incident information to an adjacent airport, communicating with applicable air traffic control facilities.

Unit III

18 Hrs

Apparatus Rescue Tools and Equipment, Driver/Operator safety, Strategic and Tactical Operations, ARFF Fire Fighting/Pit Fire, Fuelage Fire & Wheel Fire

Unit IV

18 Hrs

Fire management on the interior of an aircraft, Ventilating an aircraft through available doors and hatches, evacuation process,

Unit V

18 Hrs

Locating and disentangling an entrapped victim from an aircraft Airport Emergency Plans, Helicopter Familiarization (Air E Vac), JPR Skills Testing.

OUTCOME:

1. Understand the fire management
2. Learn about the ventilating an aircraft through available doors and hatches
3. Understand about locating and helicopter familiarization

COURSE XIX
PRACTICAL IV
EVACUATION AND RESCUE PROCEDURE

COURSE XX

PROJECT

- The students of this course are required to undertake a project work individually on a specific topic during the fourth semester and submit a report at the end of the semester but before the commencement of the end semester examination.
- The objective of the Project work is to understand the problems faced by the organization and offer specific suggestions to solve those problems.
- The period of the project work can be decided the centres concerned according to the availability of the opportunities available. The choices could be either the student can take up the work on a daily basis in the afternoon or evening throughout the semester or for a period of one month after completion of the classes, before the examinations.
