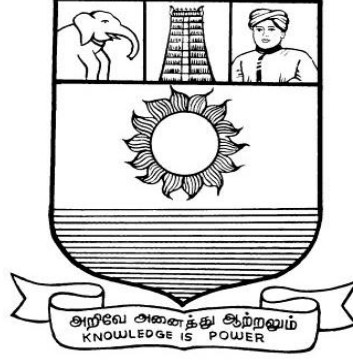


மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்  
திருநெல்வேலி – 627 012

**Manonmaniam Sundaranar University  
Thirunelveli – 627 012.**



கல்விசார் நிலைக்குழுக் கூட்டம்

**MEETING OF THE STANDING COMMITTEE ON  
ACADEMIC AFFAIRS HELD ON 09.02.2017**

**Syllabus for Diploma in Fire and Safety Management Course  
offered through Directorate of Vocational Education  
Community Colleges from 2017 - 2018**

**DIPLOMA IN FIRE AND SAFETY MANAGEMENT**  
**SCHEME OF EXAMINATION**

<b>Subject code</b>	<b>Title of the Paper</b>	<b>Credit</b>	<b>Hours</b>	<b>Passing Minimum</b>
<b>Semester I</b>				
C17FS11	Safety Management	6	90	40/100
C17FS12	Basics of Fire fighting and Control	6	90	40/100
C17FS13	First Aid	6	90	40/100
C17CE10	Communicative English	6	90	40/100
C17FSP1	Practical - I General First aid and Fire Fighting Equipments - Operations and Repairing	6	90	40/100
<b>Semester II</b>				
C17FS21	Management and Risk Assessment	4	60	40/100
C17FS22	Chemical and Oil Industries Safety Management	4	60	40/100
C17LS23	Life Skill	4	60	40/100
C17FS24	Personality Development	6	90	40/100
C17FSP2	Practical - II Fire Fighting Drills - Solids and Liquids	6	90	40/100
C17FSP3	Practical - III Rescue Equipments - Operations and Repairing	6	90	40/100
<b>Semester III</b>				
C17FS30	House Keeping	4	60	40/100
C17FS31	Construction Safety Management	4	60	40/100
C17FS32	Marine Fire Fighting	4	60	40/100
C17FSP4	P- IV -Internship	6	90	40/100
C17FSP5	Practical - V Fire Fighting Drills - Electrical and Gases	12	180	40/100
<b>Semester IV</b>				
C17FS40	Fire Accident Prevention	4	60	40/100
C17FS41	Environmental Fire Safety	4	60	40/100
C17FS42	Aircraft Fire Fighting	4	60	40/100
C17FSP6	Practical - VI Evacuation and Rescue Procedure	6	90	40/100
C17FSPW	Project	12	180	40/100

**Eligibility for admission:** Pass in 12<sup>th</sup>std 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 paper is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the papers and as given below:

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

## **Syllabus**

### **First Semester:-**

- Paper I - Safety Management
- Paper II - Basics of Fire fighting and Control
- Paper III - First Aid
- Paper IV - Communicative English
- Paper V - Practical - I General First aid and  
Fire Fighting Equipments - Operations and Repairing

### **Second Semester:-**

- Paper VI - Management and Risk Assessment
- Paper VII - Chemical and Oil Industries Safety Management
- Paper VIII - Life Skill
- Paper IX - Personality Development
- Paper X - Practical – II Fire Fighting Drills - Solids and Liquids
- Paper XI - Practical - III Rescue Equipments - Operations and Repairing

### **Third Semester:-**

- Paper XII - House Keeping
- Paper XIII - Construction Safety Management
- Paper XIV - Marine Fire Fighting
- Paper XV - P-IV-Internship
- Paper XVI - Practical - V Fire Fighting Drills - Electrical and Gases

### **Fourth Semester:-**

- Paper XVII - Fire Accident Prevention
- Paper XVIII - Environmental Fire Safety
- Paper XIX - Aircraft Fire Fighting
- Paper XX - Practical – VI Evacuation and Rescue Procedure
- Paper XXI - Project Work

## SEMESTER I

### **(C17FS11) SAFETY MANAGEMENT**

#### Unit I

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

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

#### Unit III

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 :

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

#### UNIT - V:

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)

#### **References:-**

1. Code of Practices on Safety Management by Occupational Safety and Health Branch Labour Department
2. Workplace Safety and Health Management by Health and Safety Authority

## **(C17FS12) BASICS OF FIRE FIGHTING AND CONTROL**

### Unit-I

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

### Unit-II

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

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

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

### Unit- V

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.

### **References:-**

1. Handbook on Building Fire Codes by G. B. Menon and J. N. Vakil
2. Industrial fire protection handbook by R. Craig schroll
3. Safety Management by R. K. Mishra

## **(C17FS13) FIRST AID**

### Unit I

Introduction – Search and Rescue – Stages of Rescue – Surface Casualties – 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

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

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

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

.

### Unit V

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.

### **References:-**

1. First Aid by George Black
2. A Textbook of First Aid by Helen Mary Perdita

## **(C17CE10) COMMUNICATIVE ENGLISH**

### UNIT- I

Communication – Meaning – Definition – Process/Element – Principles of effective communication - Importance – Modern communication devices – Barriers of communication – Measures to Overcoming the Barriers.

### UNIT – II

Structure of a business letter – Kinds of Business Letters — Letter of Enquiry – Quotations – Offers – Order letters – Trade Reference - Execution of order – Cancellation of an order.

### UNIT – III

Complaint letters – Adjustment and Settlements – Circular letters.

### UNIT – IV

Sales letters – Three P's of Sales Letters – Functions of Sales Letters.

### UNIT – V

Banking letters – Importance – Principles – Job Applications

### Reference Books:

1. Commercial Correspondence and Office management – R.S.N.Pillai and Baghavathi
2. Modern Business Correspondence and Minutes writing – J.C. Bahi and S.M. Nagamia
3. Essentials of Business communication – Rajendrapal anf J.S.Korlahali
4. Business correspondence and Report writing – R.C. Sharma , Krishna mohan
5. Modern Business Letter – L. Gartside

### **PRACTICAL - I**

## **(C17FSP1) GENERAL FIRST AID and**

## **FIRE FIGHTING EQUIPMENTS - OPERATIONS AND REPAIRING**

## **SEMESTER II**

### **(C17FS21) MANAGEMENT AND RISK ASSESSMENT**

#### Unit –I

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

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

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

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

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

#### References:-

1. Risk Assessment and Management by Lester B. Lave
2. Principles of Management: An analysis of Managerial Functions by Harold Koontz and Cyril O' Donnell



## **(C17FS22) CHEMICAL AND OIL INDUSTRIES SAFETY MANAGEMENT**

### Unit I

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

### Unit II

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

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

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

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

### References:-

1. Safety and Hazards Management in Chemical Industries by Mamta Vyas
2. Safety in Chemical Plants / Industry and its Management by Rao B K

## **(C17LS23)LIFE SKILL**

**UNIT-I ATTITUDE:** Positive thinking – Goal setting – Problem Solving and Decision making – Leadership and Team Work.

**UNIT-II COMMUNICATION SKILLS:** Oral communication: Concept of English language – Fluency – Verbal Communication in official and public situations.

**UNIT-III COMMUNICATION SKILLS:** Written Communication: Comprehension – Writing a formal letter like application for Job, enquiry, reply, complaint such others – preparation of Resume, Curriculum Vitae.

**UNIT-IV COMPUTING SKILLS – 1:** Introduction to Computers, its various components and their respective functions – Memory storage devices – Microsoft (MS) Office – MS Word.

**UNIT-V COMPUTING SKILLS – 2:** Internet Basics – Origin of Internet – Modem – ISP – Upload – Download – e-mail – Origin of worldwide web (www) Browsers – Search engines.

### **Reference Books:**

Life skill, Manonmaniam Sundaranar University Publications Division (2011)

## **(C17FS24) PERSONALITY DEVELOPMENT**

### Unit I

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

### Unit II

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

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

#### Unit IV

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

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

References:-

1. Organizational Behaviour by Stephen P. Robbins

### **PRACTICAL - II**

**(C17FSP2) FIRE FIGHTING DRILLS - SOLIDS AND LIQUIDS**

### **PRACTICAL - III**

**(C17FSP3) RESCUE EQUIPMENTS - OPERATIONS AND REPAIRING**

## **SEMESTER III**

### **(C17FS30) HOUSE KEEPING**

#### Unit I

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

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

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

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

#### Unit V

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

#### References:-

1. Housekeeping by Poonam Sinha
2. Housekeeping by Ariele Huff

## **(C17FS31) CONSTRUCTION SAFETY MANAGEMENT**

### Unit I

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

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

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

### Unit IV

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

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

### References:-

1. Construction Safety Management by Ramond Elliot Levitt and Nancy Morse Samelson

## 2. Construction Safety Management by Tim Howarth

### **(C17FS32) MARINE FIRE FIGHTING**

#### Unit I

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

#### Unit II

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

#### Unit III

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

#### Unit IV

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

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

#### References:-

1. Marine Fire Fighting by Barbara Adams, John F. Lewis and David Merk

### **(C17FSPW) 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

### **PRACTICAL - V**

#### **(C17FSP4) FIRE FIGHTING DRILLS - ELECTRICAL AND GASES**

## **SEMESTER IV**

### **(C17FS40) FIRE ACCIDENT PREVENTION**

#### Unit I

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

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

#### Unit III

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

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

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.

References:-



**(C17FS41) ENVIRONMENTAL FIRE SAFETY**

Unit I

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

Environmental Hazard classification and assessment, Environmental Hazard evaluation and control

Unit III

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

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

Unit V

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

References:-

1. Environment, Health & Safety Handbook by David Jordan

## **(C17FS42) AIRCRAFT FIRE FIGHTING**

### Unit I

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

### Unit II

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

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

### Unit IV

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

### Unit V

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

### References:-

1. Aircraft Rescue and Fire Fighting by IFSTA
2. Aircraft Rescue Fire Fighting by Ronald Dom

## **PRACTICAL - VI**

### **(C17FSP5) EVACUATION AND RESCUE PROCEDURE**

### **(C17FSPW) 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.