SWAMI VIVEKANAND UNIVERSITY, SAGAR (M.P.)

SYLLABUS

For

DIPLOMA IN HEALTH SAFETY & ENVIRONMENT MANAGEMENT

Course Code: DHSEM

Department of Fire Safety & Disaster Management

Duration of Course	:	1 Year
Examination Mode	:	Yearly
Examination System	:	Non-Grading

Swami Vivekanand University, Sironja Sagar (M.P.)
2017-2018

English Communication (DHSEM-101)

UNIT- I **Marks: 20**

Definition of leadership, Organization, Elements & Principles of good organization, Communication, Methods of Communication, Speaking skills, written communication, Formal and Informal reports.

UNIT- II **Marks: 20**

Safety communication, Managerial communication, Communication with employees with conducting training, Emergency communication, Essentials of Grammar.

UNIT- III **Marks: 20**

Parts of Speech, Types of Correspondence, Receipt and Dispatch of Mail, Types of Letters- Formal / Informal, Importance and Function.

UNIT- IV **Marks: 20**

Group Discussion & Presentation, Presentation Skills, Voice & Picture Integration, Body Language, Presentation Plan.

UNIT- V **Marks: 20**

Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures.

Text Books -

1. Herbert. A. J. The structure of Technical English Orient Longman 1995.
2. Pickett and Laster, 'Technical English, Writing, Reading and Speaking', New York Harper and Row Publications, 1997.
3. Interactive course in phonetics and spoken English published by Acoustics Engineers (ACEN) 2002

Foundation of Fire Safety (DHSEM-102)

UNIT- I **Marks: 20**

History of fire service , Force, resultant force , Mass and weight, work, power, energy , Law of conservation of energy , Mechanics – rest and motion , Distance and displacement , Speed and velocity.

UNIT- II **Marks: 20**

Acceleration, retardation, Acceleration due to gravity, Machines and engines, Efficiency, Friction, Atomic structure, Elements, compounds.

UNIT- III **Marks: 20**

Pure substance and mixture, Physical and chemical changes, Energy changes, Temperature, Heat of decomposing, Chemical reaction, Investigation of fire, Arson and detection of fires.

UNIT- IV **Marks: 20**

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, Construction, Operation ,Maintenance, refilling.

UNIT- V **Marks: 20**

Fixed fire fighting installations using water, Hydrant or fire water system, Classification of hydrant system, Sprinkling system, Special fires and fire fighting, fixed fire fighting installations not using water, Complete CO2 flooding system, Complete DCP spraying system, Complete Halon flooding system.

Text Books

Carl Goodson, “Essentials of fire fighting” Fire protection publications; 5th edit

Foundation of Construction Safety(DHSEM-103)

UNIT-I **Marks : 20**

Introduction to Construction Industry- Safety issues in construction- Human factors in construction safety management. Roles of various groups in ensuring safety in construction industry. Framing Contract conditions on safety, and related matters. Relevance of ergonomics in construction safety.

UNIT-II **Marks : 20**

Safety in various construction operations- Excavation- under- water works- under- pinning & shoring Ladders & Scaffolds- Tunneling- Blasting- Demolition- Pneumatic caissons- confined Space Temporary Structures. Indian Standards on construction safety- National Building Code Provisions on construction safety.

UNIT-III **Marks : 20**

Safety in material handling and equipments-Safety in storage & stacking of construction materials.

UNIT-IV **Marks : 20**

Safety in these of construction equipments- Vehicles, Cranes, Tower Cranes, Lifting gears, Hoists & Lifts, Wire Ropes, Pulley blocks, Mixers, Conveyors, Pneumatic and hydraulic tools in construction. Temporary power supply.

UNIT-V **Marks : 20**

Contract Labor (R&A) Act and Central Rules: Definitions, Registration of Establishments, Licensing of Contractors, Welfare and Health provisions in the Act and the Rules, Penalties, Rules regarding wages. Building & Other Construction Workers (RE&CS) Act,1996 and Central Rules, 1998: Applicability, Administration, Registration, Welfare Board & Welfare Fund, Training of Building workers, General Safety, Health & Well fare provisions, Penalties.

References:

1.K.N.Vaid,ConstructionSafetyManagement.

2. V.J. Davies and K.Tomasin, Construction Safety Handbook.

3. James B.Fullman, Construction Safety, Security & Loss Prevention

4.LingerL,ModernMethodsofMaterialHandling

5. R.T. Ratay, Hand book of Temporary Structures in Construction.

6. National Building Code of India

7.RelevantIndianStandardspublishedbyBIS

8. Contract Labour Act and Central Rules

9.Building&OtherConstructionWorkers(RE&CS)Act,1996andCentralRules.

Fire Extinguishing Systems (DHSEM-104)

UNIT- I **Marks: 20**

Combustible Matter, Flammable/Combustible Liquids, Classification Of Petrochemicals Liquids As Per NFPA, Combustible Gases.

UNIT- II **Marks: 20**

Combustion and It's Types ,Oxygen Content in Air by Weight And Volume, Combustion of Solid ,Liquid and Gases Exothermic and Endothermic Reactions, Jet and Flash, Flames and its types, Premixed ,Diffusion, Turbulent Stationary and Propagating Flames Burning Velocity ,Flash Point, Fire Point, Transmission of Heat by Conduction Convection and Radiation.

UNIT- III **Marks: 20**

FIRE: Definition of Fire, Fire Triangle, Tetrahedron of Fire, Classification of fires, Types of Extinguishing Media of Agent, Principles of Fire Extinguishing Methods Cooling, Starvation ,Smothering(Blanketing),Retarding Chain Reaction.

FIRE EXTINGUISHING MEDIA OR AGENTS:

Extinguishing Property of Water, Characteristics of Ideal Liquid Extinguishing Agent, Various Forms of Water Like Solid Stream ,Fog, Spray.

UNIT- IV **Marks: 20**

Types of Foam Concentrate, Protein, AFFF, Fluoro Protein, Alcohol Types, Low, Medium and High Expansion Foam, Physical and Chemical Properties of Foam.

UNIT-V **Marks: 20**

Sprinklers Automatic Alarms Water Tenders, Fire Extinguishers, Fire Prevention And Inspection Procedures , Fire Protection Law as/Bye Laws .

Text Books

Carl Goodson, “Essentials of fire fighting” Fire protection publications; 5th edit

Environmental Safety (DHSEM-105)

UNIT- I **Marks: 20**

Air Pollution Management Air Pollution, Air pollution Measurement, Air quality monitoring, Air pollution modeling, Air pollution control Technology & method, Equipment Selection, Equipment design, Particulate emission control, Sources corrective methods, Air quality management concept.

UNIT- II **Marks: 20**

Water pollution Management Concept of water pollution, characteristic of waste water, standards of pollution parameters methodology of waste water treatment, Water Treatment process, Sedimentation, coagulation and flocculation, Filtration, Advanced Water Treatment processes, Industrial Water pollution management.

UNIT- III **Marks: 20**

Solid & hazardous waste management & risk analysis: Sources, Classification and composition of MSW (Municipal Solid Waste), Waste Minimization of MSW, Thermal Treatment (Combustion) of MSW, Hazardous Waste Transport & treatment facilities, Treatment systems for hazardous waste & handling of treatment plant residues.

UNIT- IV **Marks: 20**

Environmental management in industries, Principals & requirements of ISO 14001 EMS, Environmental auditing & Auditing of waste minimization. Environment Impact Assessment, Environment Management Plan. EIA, EMP and Environmental Auditing Environmental impact assessment, base line for existing data collection & identification of impact, prediction of impacts, Evaluation of impacts.

UNIT- V **Marks:20**

Handling storage and transportation of health care waste, Waste segregation packaging on site collection Transport & storage of waste treatment and disposal of health care waste. Incineration chemical infection wet and dry thermal treatment, microwave irradiation, land disposal, winterization treatment and disposal method from pharmaceutical & chemical waste; Training for health care personal and waste management operators.

References:

1. Environmental Management Handbook by Marcel Dekker.
2. Environmental Management Handbook for Hydrocarbon Processing Indus.; James B. Wall.
3. Environmental Safety and Health Engineerings by Gayle wood side and Dianna Koeurek.
4. Waste Management by Rajiv K. Sinha.
5. Hazardous Waste Management by J.M. Dewan.
6. Perspectives in Nuclear Toxic and Hazardous Waste by Kadambari Sharma.
7. Water Pollution, Causes Effects & Control by P.K. Goel.
8. A to Z of Environmental Audit, A. Mehrotra.
9. Elements of Biotechnology -P.K. Gupta 10. A text book on biotechnology by H.D. Kumar

Industrial Safety (DHSEM-106)

UNIT- I **Marks: 20**

Introduction & Principles of Accident Prevention-

Management: Concept, definition, nature and importance evolution of management thoughts and principles, Role and functions of a manager, elements of management, functions**,** Management Principles: General principles of Management, managerial role authority, responsibility and power, span of management, Delegation and decentralization of authority**,** Industrial Safety: Role of Management in Industrial Safety, Safety, Management – Principals and practices.

Definitions: Incident, accident, injury, and dangerous occurrences, unsafe acts unsafe conditions hazards (error, oversight, and mistake) near miss incident frequency and security rate, Accident: Theories/models of accident occurrences, principles of accident, prevention.

UNIT- II **Marks: 20**

Planning for safety & Organizational Behavior and Safety Human factors contributing to accidents -

Planning: Definition, purpose, nature, scope and procedure, range of planning, variety of plans, strategic planning and process of implementation, Management by objectives and its role in safety, policy formulation.

Analysis of accident data with respect to various parameters accident investigation, remedial measures, implementation of remedial measures, why analysis for accident investigation Human behavior: Individual differences, behavior as function of self and situation, perception of danger and acceptance of risks, knowledge and responsibility Vis-à-vis safety performance theories of motivation and their application of safety role of department in motivation ,Conflict and Frustration: Identification of situations leading to conflict and frustration and techniques of management.

UNIT- III **Marks: 20**

Safety Education and Training -

Training for Safety: Element of training, cycle, assessment of neeIds , techniques of training, design and development of training programmed, training methods and strategies (types of training, evaluation and review of training programmed).

UNIT- IV **Marks: 20**

The Factories Act, 1948 and the Factories Rules: History of the Factories Act, Provisions under the Factories Act and Rules made there under with amendments, case laws under the Factories Act.

UNIT- V **Marks: 20**

ILO Convent and Recommendation: Role of ILO, relevant conventions and recommendations in the furtherance of safety, health and welfare.

References-

1.FactoriesAct,1948 with aamendments of1976&1987.
2.DockWorkers(SHW)Act,1986;Rules,1990&Regulations,1990.
3.ExplosivesActandRules.
4.PetroleumActandRules.
5.EnvironmentalActs&Rulesasabove

Design & Installation of Fire Safety Devices (DHSEM-107)

UNIT- I **Marks: 20**

Grouping of Fixed-Fire-fighting Installations, Provisions of First Aid Fire-Fighting Arrangements, External Hydrants, Ring-Mains. Rising Mains: Down Comer, Dry-riser, Wet-riser and specifications of each types, their relevant code of practices.

UNIT- II **Marks: 20**

Water Supply & Hydrant System: Grading, Requirement of water supply, Total requirement of water for different hazards pressure tanks water supply, Designing of Fire Hydrant System for different occupancies.; Designing of HVWSS/MVWSS/Sprinklers System: Types of Sprinklers system and its specification New Standard for the installation of sprinklers and Hazard classification. Multiple Jet sprinklers, Water spray projector system, MVWSS and HVWSS-Drenchers: Different types of Drenchers, Rules for spacing sprinklers and drencher's heads.

UNIT- III **Marks: 20**

Mechanical Foam Installations: Determination of foam compound for fire-fighting in oil tanks, Methods of application. Top application Base injection, Sub-surface Injection. Foam inlets and Risk for which foam is used. Premix foams, Installation characteristics of foam. Different types of foam, Low expansion, Medium expansion and High expansion foam, their special application, advantage and disadvantages of various types and the storage of foam concentrates.

UNIT- IV **Marks: 20**

Installations Involving Carbon-di-oxide and Dry powder: Their special features, Characteristics, Designing, arrangements, operation, extinguishing action, risks and specification.

UNIT- V **Marks: 20**

Fire Alarm & Detection System: Designing, Calculations, Installation, Testing and Maintenance, Working principle of smoke detectors, heat detectors, Flame detectors & optical beam type detectors.

References: 1. Standard Installation of sprinkler system by NFPA.
2. A Study of Performance of Automatic Sprinkler System by NFPA.
3. National Fire Code of Sprinklers by NFPA.
4. Care and Maintenance of Sprinkler System by NFPA.
5. Fire and Fire Risers by UNISEF Publication.
6. Relevant Indian Standards and Code of Practices.

Project Work (DHSEM-108)

1. Project work on “On Site Emergency Plan a Chemical / Explosive / Steel Industry”
2. Project work on study of fire hazards associated in Industrial process / activities and safety precautions taken for these hazards.
3. Project work on security arrangements of Red Alert
4. Project work on security arrangements of Mob Controlling
5. Project work on installation, servicing and maintenance of portable fire extinguisher installed in Industry.
6. Project work on safety and security arrangements of Railway Station.
7. Project work on firefighting equipment provided in an Industrial fire station.
8. Project work on safety arrangements in a Power Plant.
9. Fire Safety for storage of hazardous goods in Industry.
10. Project work on any one type of fire tender used in Industry.
11. Project work on safety arrangements in Explosive Plant / Storage.
12. Project work on fire safety arrangements in High rise Building.