

PG DIPLOMA IN HEALTH, SAFETY & ENVIRONMENT (PGDHSE)

Eligibility – Graduation/Diploma in Engineering Duration -1 Year

Subjects:

Sr	Subject Name	Subject Code	Theory	Practical
1	Safety Management	PGDHSE -01	80	20
2	Fire Safety & First Aid	PGDHSE-02	80	20
3	Industrial Health & Hygiene	PGDHSE-03	80	20
4	Industrial Hazard & Safety	PGDHSE-04	80	20
5	Environment Management System & ISO 14001	PGDHSE-05	80	20
6	Safety & Environment Legislation	PGDHSE-06	80	20
7	Practical & Viva	PGDHSE-07	80	20

Detailed Syllabus

1	Safety Management	PGDHSE -01	38 Hrs
----------	--------------------------	-------------------	---------------

Unit I (08 Hours)

Evolution of modern safety concept- Safety policy - Safety Organization ,Line and staff functions for safety- Safety Committee- budgeting for safety, Incident Recall Technique (IRT), disaster control, Job Safety Analysis (JSA),Safety survey, safety inspection, safety sampling, Safety Audit.

Unit II (06 Hours)

Concept of an accident, reportable and non reportable accidents, unsafe act and condition principles of accident prevention, Supervisory role- Role of safety committee – Accident causation models - Cost of accident.

Unit III (12 Hours)

Overall accident investigation process - Response to accidents, India reporting requirement, Planning document, Planning matrix, Investigators Kit, functions of investigator, four types of evidences, Records of accidents, accident reports, Permanent total disabilities, permanent partial disabilities, temporary total disabilities, Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate, safety “t” score, safety activity rate, Information sources for safety monitoring.

Unit IV (12 Hours)

Procedures and Arrangements for Safety Monitoring, Safety Monitoring Methods and Programs, Measuring the hazard burden, Measuring the health and safety culture, Importance of training-identification of training needs-training methods – program, seminars, conferences, competitions, Method of promoting safe practice - motivation –communication - role of government agencies and private consulting agencies in safety training, Creating awareness, awards, celebrations, safety posters, safety displays, safety Pledge, Safety incentive scheme, safety campaign. Domestic Safety and Training.

2	Fire Safety & First Aid	PGDHSE-02	36 Hrs
----------	------------------------------------	------------------	---------------

Unit I (06 Hours)

Chemistry of Fire, Oxidation, Slow – rapid – spontaneous combustions, chain reaction, Flash point & Fire point, ignition temperature, Classification of Fire, Methods of extinguishment, First aid fire fighting arrangement, Types of fire extinguishers.

Unit II (06 Hours)

Fixed Installation: External hydrant, Ring mains, Hose reels, wet and dry riser, Automatic sprinkler system, Deluging system, Drencher system, Pre-mixed foams solutions, Fire alarm system, Flooding system, Hydrostatic: Hydrostatic pressure, Absolute and gauge pressure, Pressure reassurances, hydrostatic forces, Hydro dynamics: Introduction.

Unit III (08 Hours)

Basic parameters of flow, Newton's Laws applied to fluids, Work, energy and power, Law of conservation, Flow in pipes and fire hoses, Hydraulic and energy grade lines, Friction losses in pipes and hoses, Rule of hump computations, Pumps and classification, Discharge and suction head, Pressure and power requirements, Starting and trouble shooting, Pump testing and relay operation.

Unit IV (06 Hours)

Water hammer, Parallel and series connections, Branching lines, local losses, Fire streams- Introduction, discharge from a nozzle, range of a good fire stream, Fire loss control : Principles of fire loss prevention, fire protection manual, Fire safety data sheet.

Unit V FIRST AID (10 Hours)

Introduction, Action at Emergency, The practice of First Aid, Principles of First Aid, Training in First Aid, General rules of First Aid, Shocks, Electrical Shock, Artificial Respiration, Cardio Pulmonary Resuscitation, Choking, Fainting, Poisoning, Open Wounds, Control of bleeding, Burns and Scalds, Heart Attack, Resuscitation, Disorder of respiratory system, Disorder of Circulation, Wound & Bleeding, Disorders of consciousness, Bone, Joint & Muscle injury, Burns & Scalds, Effect of heat & cold, Foreign bodies, Poisoning ,Dressing & Bandages, Handling & transport of injured, Emergency First Aid.

3	Industrial Health & Hygiene	PGDHSE-03	25 Hrs
----------	----------------------------------------	------------------	---------------

Unit I (06 Hours)

Personal Protective Equipment (PPE) ,Permissible Exposure Level (PEL) of chemicals in work environment, Permissible Exposure Level (PEL) of sound level in work environment, Method of calculation for TWA of chemical and sound level in work environment

Unit II (07 Hours)

Safe handling practices of chlorine, hydrogen, hydrochloric acid, ammonia, caustic soda, Ventilation, Lighting, Hazards in chemical industry, Occupational health management in industry and selected modifiable diseases, Basics of Fire Prevention as per FSR, Case studies

Unit III (06 Hours)

The Factories Act: The Industrial Disputes Act, 1947 - Wage Legislations - The Payment of Bonus Act, 1965 -The Factories Act, 1948

Unit IV (06 Hours)

Manufacture, Storage and Import of Hazardous Chemicals Rules, Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, Gas Cylinder Rules, Static and Mobile Pressure Vessels (Unfired) Rules

4	Industrial Hazard & Safety	PGDHSE-04	30 Hrs
----------	---------------------------------------	------------------	---------------

Unit I (06 Hours)

Introduction: Safety program, Engineering ethics, Accident and loss statistics, Acceptable risk, Public perception, Toxicology: How toxicants enter biological organisms, How toxicants are eliminated from biological organisms

Unit II (08 Hours)

Industrial Hygiene: Government regulations, Identification, Evaluation, Control, Fires and Explosions: The fire triangle, Distinction between fire and explosions; Definitions, Flammability characteristics of liquids and vapors, MOC (Material of Constructions) and inerting, ignition energy, Auto ignition, Auto oxidation, Adiabatic compression, Explosions.

Unit III (12 Hours)

Designs to prevent fires and explosions: Inerting, Explosion proof equipment and instruments, Ventilations, Sprinkler systems, Introduction to Reliefs: Relief concepts, Definitions, Location of reliefs, Relief types, Data for sizing reliefs, Relief systems, Relief Sizing: Conventional spring operated relief's in liquids, Conventional spring operated relief's in vapor or gas service, Rupture disc relief's in liquid, vapor or gas service.

Unit IV (04 Hours)

Hazards Identification: Process hazards checklists, Hazard surveys, Hazop safety reviews.

5	Environment Management System & ISO 14001	PGDHSE-05	22 Hrs
----------	----------------------------------------------------------	------------------	---------------

Unit I (04 Hours)

Environmental Management An Overview, Strategic planning, Sustainable Development

Unit II (06 Hours)

Definition of ISO 14001, Aspect and impact analysis, Advantage of ISO, Certification of ISO, Pollution Control Tangible and Intangible benefits of ISO

Unit III (04 Hours)

Resource conservation, Waste Water Treatment and Disposal

Unit IV (04 Hours)

Definition, OHSAS.18001. Documentation, Certification, Risk and Hazard analysis, Management programs, Audit and compliance to standard

Unit V (04 Hours)

Accident analysis, Case study and Exercise, Visit to the construction site.

6	Safety & Environment Legislation	PGDHSE-06	38 Hrs
----------	---------------------------------------------	------------------	---------------

Unit I (08 Hours)

Management, administration and organization ; Importance and characteristics of management, managerial skills and objectives, Difference between policies, goals and objectives ; scientific management, principle of management, function of management

Unit II (08 Hours)

Industrial management, types of management, management chart, management development, project management ; management information system, Concept of personal management ; aim objectives and function of personal management ; Recruitment and selection of employees, discipline in industry

Unit III (06 Hours)

Importance and necessity of labor acts, principle of labor legislation, types of labor laws, worker's participation in management, Union –Management relation

Unit IV (10 Hours)

Factory Act – objects and scope; Approval, licensing and registration of factories; Health and Safety : Welfare ; Working hour ; Special provision ; Penalties and procedure, Workmen's Compensation Act- Main features of the act, Employer's liabilities for compensation, Amount of compensation, Notice and claims of accident, medical examination

Unit V**(06 Hours)**

Industrial Dispute Act – Introduction and scope of act, Authority under this act, Strikes and Lock-out, Lay-off and retrenchment. Penalties

7	Practical & Viva	PGDHSE-07	30 Hrs
----------	-----------------------------	------------------	---------------