

Subject Code: 1ET0010201	Subject Name: Occupation Health & Safety
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Unit I: Introduction

Introduction, hazards, hazard monitoring , different stages of process life time – Hazard reduction approaches and inherent safety review-Selection of hazard evaluation techniques - Factors influencing the selection of hazard evaluation techniques - decision making process - hazard review for management changes - combined hazard review - hazard evaluation - Risk issues.

Unit II: Hazard Evaluation Techniques - Non Scenario Based

Checklist analysis, safety review, relative ranking, preliminary hazard analysis (PHA), fire explosion and toxicity index (FETI)

Unit III: Hazard Evaluation Techniques - Scenario Based

Fault Tree Analysis & Event Tree Analysis –what-if analysis/checklist analysis-hazard operability studies (HAZOP) -Failure Mode and Effect Analysis (FMEA)

Unit IV: Risk Management System

Emergency preparedness –Emergency Plans & Staff Training - Safety Management and legislation - Functions of safety management - Factories Act 1948 - Workmen compensation Act 1923.

Unit V: Instrumentation

Applications of Advanced Equipment and Instruments, Thermo Calorimetry, Differential Scanning Calorimeter (DSC), Thermo Gravimetric Analyzer (TGA), Accelerated Rate Calorimeter (ARC), Principles of operations, Controlling parameters, Applications, advantages. Explosive Testing, Deflagration Test, Detonation Test, Ignition Test, Minimum ignition energy Test, Sensitiveness Test, Impact Sensitiveness Test (BAM) and Friction Sensitiveness Test (BAM), Shock Sensitiveness Test, Card Gap Test.

Subject Code: 1ET0010202

Subject Name: Accident Prevention & Risk Management

Unit I: Accidents Causes and Management Systems

Problems impeding safety in construction industry-causes of fatal accidents, types and causes of accidents related to various construction activities, human factors associated with these accident–construction regulations, contractual clauses –Pre contract activities, preconstruction meeting - design aids for safe construction –permits to work –quality assurance in construction - compensation –Recording of accidents and safety measures – Education and training

Unit II : Hazards of Construction and Prevention

Excavations, basement and wide excavation, trenches, shafts –scaffolding , types, causes of accidents, scaffold inspection checklist –false work –erection of structural frame work, dismantling – tunneling –blasting, pre blast and post blast inspection –confined spaces – working on contaminated sites –work over water -road works –power plant constructions – construction of high rise buildings.

Unit III : Working at Heights

Fall protection in construction OSHA 3146 –OSHA requirement for working at heights, Safe access and egress –safe use of ladders-Scaffoldings , requirement for safe work platforms, stairways, gangways and ramps –fall prevention and fall protection , safety belts, safety nets, fall arrestors, controlled access zones, safety monitoring systems –working on fragile roofs, work permit systems, height pass –accident case studies.

Unit IV : Construction Machinery

Selection, operation, inspection and testing of hoisting cranes, mobile cranes, tower cranes, crane inspection checklist -builder's hoist, winches, chain pulley blocks –use of conveyors - concrete mixers, concrete vibrators –safety in earth moving equipment, excavators, dozers, loaders, dumpers, motor grader, concrete pumps, welding machines, use of portable electrical tools, drills, grinding tools, manual handling scaffolding, hoisting cranes –use of conveyors and mobile cranes – manual handling.

Unit V : Safety in Demolition Work

Safety in demolition work, manual, mechanical, using explosive -keys to safe demolition, pre survey inspection, method statement, site supervision, safe clearance zone, health hazards from demolition.

Subject Code: 1ET0010203

Subject Name: Indian Safety Act & Work Permit

Unit I : Work Permit

Name of work permit, Letter of work permit, Safe work permit, gas work permit, Hot work permit, permit to work in confined place, work permit electrical, work permit working at height

Unit II : Responsibilities of Safety officer

Function of safety department, Tools of a leader to achieve the common goals, judiciousness and sympathy to work their subordinates.

Unit III : Introduction of Factory act 1948

Introduction, Aim of act, main provision of the factory act, Explain the main characteristics of the factory act 1948, features of Factories, Registration of factories, occupier inspecting staff, certifying surgeon precautions against dangerous fumes, precaution in case of fire.

List of Experiments

1. PPE (Personal Protective Equipment) & their Application.
 - Safety Helmet
 - Safety Goggles & Face Protection
 - Safety Shoes
 - Mask
 - Hand Protection
 - Ear Plug & Ear Muff
 - Safety Harness
 2. Hands on operation of Fire Safety Equipment
 - Fire Detector & Alarm System
 - Fire Suit
 - Fire Extinguishers & Its types
 3. Study of Principle and working of Instruments Used In Industrial Safety
 - Lux Meter
 - Noise Level Meter
 - Dust Sampler
 4. Self Contained Breathing Apparatus (SCBA)
 5. Safety Inspection and Audit
 6. Tool Box Talk
 7. Mock drill
 8. Hazard Identification and Risk Assessment
 9. Safety Training
 10. Accident/ Incident/ Near miss Investigation, analysis and reporting
- Project report