JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FIRST SEMESTER

1. FUNDAMENTALS OF BASIC SCIENCES

Unit1- Toxicology: Definition of Toxicology, Basics of Toxicology, Industrial exposure, identifying the toxic substances at work place and measuring of toxic substances, prevention of entry of toxic substances in to the human system, TLV(Threshold limit value), LD (Lethal Dose), Lethal Concentration (LC), IDLH (Immediately Dangerous to life and Health), toxic substances exposure and its effects on human body, emergency treatment for toxic substances. Concepts of Industrial Toxicology.

Labs: Any two

1. Toxicology- How to identify the toxic material, Measuring toxicity levels in blood and urine
2. PM-10 and Demonstration of Respirators
3. Measuring of Toxic gases in different Scenarios.

Books:
1. Industrial Toxicology by Irving Sax
2. Hamilton and Hardy Industrial Toxicology
3. Medico legal and industrial Toxicology by Henry J.

Unit2- Basics of **Bio statistics:-**Introduction and scope of biostatistics and its applications. Use of statistics in Biological perspective, Population and sample. Stages of research, types of data and methods of data collection. Data-arrangement and presentation, formation of tables and charts. Measures of central tendency: computation of mean, median and mode from grouped and ungrouped data. Measures of dispersion: computation of variance, standard deviation, standard error and their coefficients. Probability rules. Binomial, poison and normal distributions. Hypothesis testing: Student‘t’ test, Chi square test, Analysis of variance. Correlation and Regression analysis. Experimental designing, planning of an experiment, replication and randomization.

Labs:

1. Biostatistics
2. Use SPSS / STATA Package
3. Perform two sample comparisons of means and create confidence intervals for the population mean differences and Compare proportions amongst two independent populations.
4. Interpret output from the statistical software package STATA related to the various estimations and Hypothesis testing procedures covered in the course

Books:

1. Biostatistics by Arora,
2. Basic Bio Statistics for Public Health Practice By B Burt Gers,
3. Bio statistics for Health and Life Sciences by Surya

Unit3- Industry and Your Health – Protection of employee and employer health, Volatile organic compounds (VOC's), protection of ecology and neighborhood health, monitoring and evaluation of stack emissions and particulate matter. Health promotion and Health education in industry, statistics in different occupations in different industries. Exposer to different toxic materials and their controls. Introduction to Industrial Hygeine. Epidemiological exposes and industrial toxic substances a case study

Labs:

1. Industry and Your Health- Noise and Dust measurements,
2. VOC's for toxic gases and Effluent Treatment plants.
3. Case Studies of exposers.

Books:

1.Current topics in Occupational Epidemiology edited by Katherine Vanables
2.Epidemiology Public Health Medicine by Norman Vetter, Ian Matthews
3.Industrial Toxicology by Irving Sax

Unit4- Basic Health Sciences:-Musculo skeletal system, classification of joint, connective tissue, osteology, Histology, structure of spine, Spinal cord, Sympathetic and Para sympathetic nervous system, axial Skeleton, apendicular Skeleton. Exercise Physiology, Muscular skeletal disorders, prevention of skeletal disorders, Lung Physiology (volumes, and pressures) pulmonary function tests and its significance, cardio vascular Physiology, fluid and water balance, mineral metabolism, Nerve and Muscle, Ph and acid base balance, Nutrition, Pro biotics, Cell energy, Micro nutrients, energy balance, Water metabolism , Ergonomics Postures, bio engineering in ergonomics, Work place ergonomics, ergonomics in relation to occupation, Construction ergonomics,

Labs:

1. Anatomy - Specimen Reading, cardio pulmonary resuscitation, Spiro meter. Musclo Skeletal fitness assessment
2. Physiology- Blood Grouping, Blood Transfusion, Blood Examination
3. Ergonomics demonstration

Books: 1. Gray's Anatomy, Principles of Anatomy by Gerard J. Tortora, and Bryan H. Derrickson,
2. Cunningham Manuals 1-3,
3. Introduction to Poditr Neale's disorders of the foot- diagnosis and management, Editor Donold L. Lorimer, Gwen French.

Unit 5 - Skills- Inter personality Development Skills, Paper writing Skills, Presentation Skills, Communication Skills, Morals & ethics, Plagiarism and its impact on present day academics and skills. Patents and intellectual property protection**,** Behavioral Modification (STOP Programme), group dynamics, etiquette, Commercial awareness, team work, time management, planning and organizing, Goals setting skills, leadership quality, personal impact and confidence, coping with stress, honesty and integrity, decision making, team work,

Lab 1: Exercises : Paper writing,
Lab 2: weekly Presentations(every Saturday)
Lab 3: Team work for the development of Research topics,, Business development

Books:
1.Personality Development and Soft Skill, by Varun K.Mitra.
2. The Ace of Soft Skills, Gopala Swamy Ramesh.
3. Soft Skills for Every One, Jeff Butter field
4**.**Lectures by experts

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FIRST SEMESTER

2.SAFETY MANAGEMENT

Unit-1 Concept of management:-

- Definitions, nature & importance of management
- Elements of management functions
- Management principles

Unit-2 Safety at design Stage:-

Safety management & its Responsibilities

- Safety management Defined
- Safety Management role, leadership, communications
- Safety and purchasing policy
- Role of supervisors, role of workers, role of trade unions
- Role of competent persons
- Role of safety specialists, consultants & professionals
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Unit-3 :- Safety Organizations:-

- Types of objectivities
- Role of organizations
- Safety Department:- Size, Status, & functions
- Safety Officer;- Need roles and duties of S.O
- **Formulating safety programmers & Conducting safety programs**
- Approach to compliance

Unit- 4 Safety education and Training:-

- Definitions, Elements of Safety Training
- Assessment of training needs
- Objectives of training, Techniques of training
- Design and development of training programmer
- Training methods & strategies types of training
- Training of workers & supervisors
- Need of retraining
- Integration of safety training with job training
- Types of training aids
- Evaluation & Review of training programmers

Unit- 5 Employee participation in safety:-

- Purpose
- Area of Participation
- Methods of participation:-
  - Safety Committee, Workers & Union Participation
  - Supervision Safety Contacts
  - Safety Suggestion Scheme
  - Safety Competitions
  - Safety Incentive Scheme
  - Other Promotional Activities

LABS:-

Lab1:Factory visit to learn Safety Procedures
Lab2:Handling of Hazardous materials
Lab3: Presentation by Students

Reference Books:

1. Industrial Safety management. By L.M Deshmuk.
2. Safety management, By R.S. Rathore and S, Changeriya.
3. Safety Security and Risk Management, By UK. Singh

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FIRST SEMESTER

3. BASIC PRINCIPLES OF ENVIRONMENT AND AIR POLLUTION

Unit1- General Principles of Environment: Man and Environment, evolution of species, evolution of life and environment, environmental education and awareness, Introduction, kinds of ecosystem, structure and function of ecosystem, functional aspects of ecosystem, ecological Energetic, major ecosystems, Bio Remidiation, Ecosystem bio diversity, flora & fauna of India, medicinal plants, conservation of species in India, national parks.

Major world environmental disasters and lessons learnt:- Bhopal gas tragedy India, Mumbai High Platform burning and in abroad Piper Alpha Disaster, Maconda Blowout etc.
Ecological Balance: De forestation, Conservation of national resources, forest. covers (Reforestation), desertification, , agro forestry, wetlands in India, Mangroves in India. Carbon credits and its benefits.

Unit2 : Environmental Pollution: Introduction to pollution, what is pollution, why pollution is harm to your health. carbon monoxide, sulfur dioxide, chlorofluorocarbons (CFCs) and nitrogen ,ozone , smog, hydrocarbons, Particulate matter, micrometre size PM_{10} to $PM_{2.5}$.Light pollution: includes light trespass, over-illumination and astronomical interference , Littering: Noise pollution: Soil contamination heavy metals, herbicides, pesticides and chlorinated hydro carbons. Radioactive contamination,Radaon Gas,Thermal pollution,.Water pollution, waste water, eutrophication and littering., Plastic pollution

Unit3-Air pollution: composition of air, chemical composition of atmosphere, reactions in troposphere, stratosphere, mesosphere, ionosphere..Classification : Out Door and Indoor Air Pollution, Air pollutants, sources and affects of particulates, NO_x ,SO_x , CO, CO_2, hydrocarbons on human, cattle, crops & vegetation and materials, Air pollution disasters (LA SMOG, London Smog, Bhopal Disaster, Legionaries Disaster) ambient air quality standards and air monitoring

Indoor Air Pollution: sources and effects of indoor air pollutants, control of indoor air pollutants. Odour air pollution: sources and control methods. Automobile pollution: Exhaust Emmissions and its control.

Unit 4: Pollution Control:Safety Measures in view of Industrial Pollution, Automobile pollution, Idfentification of Pollutants,sampling and sampling techniques, Measures to take pollution control, Dust collection systems, Scrubbers, Sewage treatment, Industrial wastewater treatment, Phytoremediation.

Unit5- Protocols: Major sources of Green House Gases , green house effect and climate change , global temperature, global warming and its effects on agriculture and health. Ozone layer, mechanism of ozone depletion. Effects and control of ozone holes, effects on, Social issues and Environment (Rio de janeiro, Kyoto Protocol, Copenhagen). United Nations conference on climatic change (Paris summit 2016 COP 21), India's role in it. Future vision in improving the Environment.

Environmental Health: Global Health and Global warming in relation to environment changes and impact on Human Health. Information Technology applications pertinent to Environment.
SUSTAINABLE DEVELOPMENT (SD)

LABS

Lab-1 Measurement of Air Quality in Indoor and Out Door
Lab-2 Effects of Ozone layer depletion on Human Health
Lab-3 Air Quality, Monitoring of Various Substances in Air
Lab-4 Case study of particulate control equipment in Industries.

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Reference Books:

1. Environment and plant Ecology By Etherington JR.
2. Ecology and Environment By PD Sharma
3. Environment Concerns and Strategies KHOSHOO TN
4. Introduction of Environment by Y. Anjaneyulu

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FIRST SEMESTER

4.WATER AND WATER POLLUTION & HEALTH

Unit1- Water : What is Water, Composition of water, Components of water, types of water, Sources and standards of Water, availability and quality of surface water (streams, aquifer, lakes, ponds, springs, artisans and impound reservoirs) water Quality standards for horticulture / agriculture and industrial use. Specifications for drinking water.

Unit2- Quality of water: required for domestic, institutional, Industrial, fire fighting, commercial, recreational purposes. Population forecasting by the following methods arithmetical, geometrical incremental increase methods. per capita demand of water in rural Indian villages, desalination process, the various factors affecting the demand of water.

Unit3 – Water Treatment : Principle and application of the following unit operations in water treatment aeration, flocculation, sedimentation, filtration, disinfections , Advanced water treatment methods (a) demineralization (b) ultra filtration (c) reverse osmosis (d) color and odor removal by activated carbon (e) iron and manganese removal .

Unit4- Waste Water Treatment : Physical constituents in waste water and Biological treatment processes of waste water activated sludge process, trickle bed filters, rotating biological contactors, stabilization ponds, aerated lagoons, anaerobic treatment, Biological Testing, (BOD, COD, TOC, Micro Organisms) primary and secondary and territory and advanced specific treatment systems.

Unit5 - Hazardous waste definition. Physical and biological routes of transport of Hazardous substances – sources and characterization categories and control. Sampling and analysis of Hazardous wastes – analytical approach for Hazardous waste characterization – proximate analysis – survey analysis – directed analysis – analytical methods.
Sources and characteristics of Solid Waste: handling, collection, storage and transport, TSDF concept. Hazardous waste treatment technologies – Physical, chemical and thermal treatment of Hazardous wastes: solidification, chemical fixation, encapsulation, pyrolysis and incineration. Hazardous wastes landfills – site selections, design and operation. HW reduction, recycling and reuse, regulatory aspects of HWM.

LABS
Lab-1 Water Analysis, Identification of test for Soft water, chlorine and fluorine
Lab-2 Testing for water borne diseases
Lab-3 (a) Quality criteria of water Per (b) Unit operations (c) Treatment processes
(d) Sedimentation, Coagulation, Filtration, Desalination (e) Advanced water treatment processes

Reference Books:

1. Water Engineering 1 By BC Punmaiah, Ashok Jain
2. Water Engineering treatment Disposal and Re use Metcalf and Eddy
3. waste water treatment for pollution control Dr.Arceivala, Tata McGraw Hill

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FIRST SEMESTER

5. ORENTATION AND MANAGEMENT OF SAFETY, HEALTH & ENVIRONMENT

Safety, Health And Environment Management

Objectives :

Equipping students with skills and techniques for:

1. Role of safety officer to develop Safety culture in industry.
2. To get familiar with causes of accidents and costs of accident. Take measures to prevent accidents and in turn loss to man, machine and society.
3. Statutory provision for constitution of safety committee, role of safety officers and measures to be taken to run the committee meetings effectively.

ORIENTATION AND GENERAL METHODS OF TRAINING - Introduction of occupational Health & Safety, General principles of Health & Safety, Accident theories, top management's Policy and commitment to the OH&S, Safety Organization, Hazard Identification and Risk Assessment, ISO 18001(Occupational Health and Safety Management System).

Unit1- Introduction to Occupational Health & Safety. General Principles of Health & safety, Top Management Commitment to OH&S, DGFASLI, DELHI and its role and functioning.

Unit2- Responsibility of Management and Government towards Occupational Health & Safety (OH&S) Management. Strategic Planning, Definition, Purpose, Nature, Scope, Procedure, Principles & Practices and tools for implementation.

Define OH&S Policy by Management, Roles and Responsibilities of Employees in the Organization towards safety, its execution by employer and followed by the employees .

Unit3- Safety Organization, Principles of Organizing OH&S, Structure of Organization, function and responsibilities of Organization. Formation of Safety Committee, Structure and functions of its members and employers.

Unit4- Monitoring of Occupational Health, Exposure assessment, Safety and Environment. Management System OSHAS. Management System 18001, Principles of Accident Prevention, definitions of Incident, Accident, Injury, Dangerous Occurrence, Unsafe Act, Unsafe Condition, Hazard, Error, Oversight, Mistake etc.

Unit5- OHS Education & Training, design & development of Training Programs, Training needs, methods and strategies. Types of training, Evaluation and Review of Training Program.

LABS

Lab-1 Drafting Policy and commitment for top management's approval.

Lab-2 Formation of Safety Committee and Preparation of agenda for Safety committee meeting of an organization.

Lab-3 Preparation of annual HSE (Health and Safety Environment) training plan for an Organization.

Reference Books:

1. Fundamentals of Industrial Safety and Health by Dr.K.L.Mistry, Siddharth Prakashan, Gujarat.
2. Industrial Accident Prevention, by:H.W.Heinrich, McGraw-Hill Book Co.
3. Accident Prevention Manual for Industrial Operations by National Safety Council, USA.

----------End of First Semester----------

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

SECOND SEMESTER

1. OCCUPATIONAL HAZARDS AND HEALTH

Unit1- Introduction

What is an occupational Hazard, Classification of Occupational Hazards, description, How to prevent, and how to manage after exposure to Mechanical Hazards, Industrial Accidents, Injuries, Classification of wounds, Fractures, Effects of Mechanical Equipment and related vibrations in different Occupations, effects of vibration on Human Health and related Hazard, Caisson's effect etc.

Unit2-Physical Hazards, Heat, Humidity, Industrial Controls, treatment methods. Noise pollution, Industrial applications in preventing noise pollution, Measurement of noise and Noise related industrial Hazards. Radiation energy, radiation exposure at work, measurement of radiation, control of radiation
Chemical Hazards of occupation, occupational skin diseases, chemical poisoning, chemical injuries, control of exposure and prevention of exposure. Chemical Hazards due to Gases, fumes, Particulate matter, Volatile chemicals (Volatile Organic Compounds or V.O.Cs). Prevention and control of chemical Hazards Biological Hazards, Assessment methodology**,** Biological occupational diseases: Caisson's effect, tetanus, Rabies, legionaries disease, Anthrax, swine flu, HIV, leptospirosis. Occupations Related to Psychological, Problems related to different Types of Stress, depression, Stress evaluation, Stress Management, personality assessment and biochemical stress evaluation. Stress relieving methods.

Unit3- Industrial House Keeping: Definition of House Keeping, 5S (Japanese System), Plant layout and **provision for good housekeeping**, maintaining and monitoring.

Unit4-Fire: Hazards associated with combustible, flammable and explosive materials during storage, handling or processing and transportation of fire Hazardous materials. Identification and envisaging fire preventive steps and control methods (if fire occurs).

Unit5-Hazard related Health Problems like Exposure radiation magnetic infrared, dust, fumes, volatile gases, and other toxic used in the specific industry

LABS

Lab1- Examination and testing of Personal Protective Equipment
Lab2- Measurement of Physical Hazards (Heat, Dust, Humidity, Noise, illumination, Radiation)
Lab3- Testing of Micro Biological Organisms , HIV ,

Reference Book:

1. Industrial Hazards and safety Hand Book By King and Magrid, Bulterworth
2. The Hazards of Work; How to fight them, By Patrick Kinnersly, Pluto Press London
3. Accident Prevention manual for industrial operations by National Safety Council, USA.
4. Industrial Safety Hand Book by William Handley

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MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

SECOND SEMESTER

2.DISASTER MANAGMENT

Unit1- Dimension of natural and Anthropogenic Disasters, Principles of Disaster Management, Organizational structure for Disaster Management. Introduction Disaster definition, Hazard, Risk, Vulnerability, Mitigation, Natural and human induced Disasters. For ex. Industrial and chemical disasters, road/rail accidents fire incidents, epidemics Fundamentals of disaster management, overview of disaster management, Difference between emergency and a disaster situation, Mitigation and strategies, Hazard identification and vulnerability analysis

Unit2- Disaster management cycles, Preparedness, disaster risk reduction, emergency response plan, people protection, response and recovery, response aims and activities, disaster recovery and plan

Unit3- Emergency health service in disasters, Infrastructure and procedures in accessing emergency situations, Indian Medical Association (IMA) and Municipal Corporation Authority(MCA) roles in disaster management, Common communicable diseases in disaster, Risk factors and spread of diseases-its outbreaks, Preventing and reducing outbreaks, Monitoring and evaluation of communicable disease control program, GIS and statistics in disaster management, Technology in disaster management, Emergency management cycles in disaster management systems, Responsible persons in EMS, Geographic management systems in disaster management, GIS and open source software and GIS advantages, Global Positioning System(GPS) applications in disaster management, Remote sensing and disaster management, Remote sensing fundamentals

Unit4- Disaster management in India, key Hazards in India, Vulnerabilities, Disaster response mechanism in India, onsite and offsite emergency plans, training, drills and exercises.

1. Oil Spill response plans, Role of Indian Cost Guards
2. Nuclear power plants- Uncontrolled nuclear reactions

Unit5- Disaster management Act,2005 and its analysis, Standard operating procedure for responding to natural disasters in India, Preparedness and emergency operation centers, **Objectives**, communication network of EOC's, National Disaster Response Force, Disaster communication, Ham radio, Knowledge of radio operation.

LABS

Lab1- Procedures involved in earthquake Measurement

Lab2- Study of the Diseases after Tsunami and adoptive preservative measures for Public Health point of view.

Lab3- Testing and measurement of poisons gases for TLV's (Thresh Hold Limit Values, Toxic Substances etc (Ammonia, Hydrogen Sulfide, Sulphur dioxide & Niters Oxide etc)

Reference Books:

1. Security Manager's Guide to Disasters By Anthony D. Manley (Author)
2. Workplace Disaster Preparedness, Response, and Management By R. Paul Maiden, Rich Paul, Christina Thompson
3. Occupational Health: Management and Practice for Health Practitioners By Jenny Acutt, Susan Hattingh

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

SECOND SEMESTER

3.SAFETY AT DIFFERENT INDUSTRIES

Unit1 Construction Safety:-

A.Site Selection, layout, applicable statutory permissions for project to come, Design safety, Site clearance for commencing project works, Soil testing, Excavation, levelling, back filling , and compaction. Temporary electrical-associated Hazards & controls.

B.Civil Construction and buildings and facilities (high raise building), Hazards associated with earth work and excavation, steel work and formation work, working at different levels, concreting etc

C.Mechanical fabrication, erection, material handling and transportation using cranes and lifting tackle, abrasive blasting & painting (nano technology, the associated Hazards and control methods)

D.Testing (Hydro test, pneumatic, electrical tests) equipment and flow lines, equipments etc.

E.Pre commissioning, preparation of punch lists and check lists during inspections and follow up actions until completion, Commissioning and handing over.

LABS

Lab 1- Table top exercise of Proper layout of Large & Medium size chemical plant.

Lab 2- Table top exercise of planning for obtaining permits to start a large size chemical plant.

Lab 3- Table top exercise on Planning the SHE (Safety, Health and Environment) Department for a Major Industry.

Reference Books:

1. Construction Safety Handbook, By V. J. Davies, Ken Tomasin
2. Principles of Construction Safety, By Allan St John Holt
3. Handbook of OSHA Construction Safety and Health, Second Edition By Charles D. Reese, James Vernon Eidson
4. The Building and Other Construction Workers Act, 1996.

Unit2 :SAFETY IN ENGINEERING INDUSTRY:

A. Machine Operation and Guarding:

Principles in machine guarding. Ergonomics of machine guarding. Type of guards, their design and selection. Guarding of different types of machinery including special precautions for wood working, paper, rubber and printing machinery, machine, tools etc. Built-in-safety devices, maintenance and repairs of guards, incidental safety devices and tools.

B Safety in the use of Machines:

Safety in the use of, 1) Power Presses (all types), 2) Shearing, 3) Bending, 4)
Rolling, 5) Drawing,6) Turning, 7) Boring, 8) Milling,Shaping, 9) Planning broaching, planting, 10) Grinding,11) CNCS.

1.2.1 Preventive maintenance, periodic checks for safe
operation.

1.2.2 Associated Hazards and their prevention.

C. Material Handling and Storage of Materials:

2.2.1 Manual:

Kinetics of manual handling. Maximum loads that could be carried. Lifting and carrying of objects of different shapes, size and weight. Safe use of accessories for manual, handling Storage of materials. Safety in stacking and un-stacking, floor loading conditions. Layout condition for safety in storage, ergonomics of manual handling and storage.

2.2.2 Mechanical:

2.2.3 PRESURE TESTING:-

High pressure hydro testing

High pressure pneumatic testing

Lifting machinery, lifts and hoists; safety aspects in design and construction, testing, use and care, signaling, inspection and maintenance. Safety in design and construction, operation, inspection and maintenance of industrial trucks, lifting tackles and loose gears, conveyors. Safety features, safe locations, testing, inspection and maintenance of lifting tackles, safe working load for all mechanical material handling equipment. The competent persons in relation to safety legislation - duties and responsibilities.

D.Hand Tools and Power Tools :

Main causes of accidents, prevention and control of accidents. Centralised and personal tool issues System. Purchase, storage and supply of tools. Inspection, maintenance and repair of tools. Detectable causes of tool failures. Tempering, safe end in and dressing of certain tool**.** Safe use of various types of hand tools used for metal cutting, woodcutting, miscellaneous cutting work, other hand tools such as torsion tools, shock tools, non-sparking tools. Portable power tools and their selection, inspection, maintenance, repair and safe use.

Use and maintenance of high pressure and pneumatic and hydraulic tools

E.Plant Design and Housekeeping:

Plant layout, design and safe distance. Need for planning and follow-up. Safety and good housekeeping. Typical accidents due to poor house-keeping. Disposal of scrap

and other trade wastes. Prevention of spillage. Marking of aisles space and othe r locations. Use of colour as an aid for good housekeeping. Housekeeping contest. Cleaning methods. Employee assignment. Inspections and checklists. Benefits of good housekeeping. Role of preventive maintenance in safety and health. Importance of standards and codes of practice for plant and equipment.

F.Industrial Lighting & Illumination:

Purpose of lighting. Benefits of good illumination. Phenomenon of lighting and safety. Lighting and the work. Sources and types of artificial lighting. Principles of good illumination. Recommended optimum standards of illumination. Design of lighting installation. Maintenance. Standards relating to lighting and color.

G.Ventilation and Heat Stress:

Purpose of ventilation. Physiology of heat regulation. Thermal environment and its measurement. Thermal comfort. Indices of heat stress. Thermal limits for comfort, efficiency and freedom from health risk. Natural ventilation. Mechanical ventilation. Air conditioning. Control of heat exposures at source, dilution and local ventilation. Recommended values for air changes required for various areas as per Factories Act, 1948 and National Standards. IS: 3103-1975-Code of practice for Industrial Ventilation, National Building Code Part VIII, and Building Services.

H.Noise and Vibration:

Continues and impulse noise. The effect of noise on man. Measurement and evaluation of noise. Noise isolation. Noise absorption techniques, silencers. Practical aspects of control of noise.

I.Electrical Hazards

Hazards of electrical energy. Safe limits of amperages, voltages. Safe distance from lines.

Capacity and protection of conductor. Joints and connections. Means of cutting off power. Overload

and short circuit protection. No load protection. Earth fault protection. Earth insulation and continuity tests. Earthing Standards. Protection against sure and voltage fluctuation. Hazards arising out of 'borrowed' neutrals. Others precautions. Types of protection for electrical equipment in Hazardous atmosphere. Electrical area classification. Criteria in their selection, installation, maintains and use.

J.Static Electricity :
Introduction, Electro-Static charging where charging can occur contact electrification. Electro
Static dischargers (sparks). Electro Static Hazards and their control. Earthing and bonding. Recommended earthling resistance for control ofelectricity.

K.Lightening Arrestors:
Definition, lightening splash, lightening strokes, lightening protection systems. Characterization of health effects of lightening stroke (electrical effects, side flashers, thermal effects, and mechanical effects. Function of lightening. Where lightening protection is required – System design, material of construction, component of a lightening arrestors, earth terminal / network.

LABS
Lab1- Testing Machine Guards
Lab2- Gas Cylinders Testing for Safety
Lab3- PPE Check up for General Hazards and Control
Reference Books:-

1. Industrial Safety By R.P.Blake
2. Accident prevention Manual for Industrial Operations By N.S.C
3. Non Destructive Testing Hand Book By Mc Master. R.

Unit-3 CHEMICAL INDUSTRIAL SAFETY- A- Material Hazards and controls, Identification & Classification of chemicals, Material Safety Data Sheets (MSDS), Safety Precautions, Supervision and Medical Examinations. Information to workers and others, Hazard Communication System, Inevitable place of Chemical Industry, Need of Safety in Chemical Industry, Types of Chemical Industries, Statutory Provisions, Indian Standards, Types of Chemical Hazards & Controls, Process Hazards and Controls.
B- Storage Hazards & Controls: Material of construction, Storage Vessels & their safety aspects, Safe Storage and Handling of Flammable solids, Liquids and Gases, safe handling of Corrosive chemicals, Safe storage & handling of Gas Cylinders, Designing Storage Shed & Tank forms placement of Containers, Storage and Handling of Chlorine , Ammonia, LPG, E.O and Ileum.
C- Utility Hazards & Controls, Instrumentation for safe plant operations, emergency response plans and drills, trainings on safe storage and handling of chemicals. Health Hazards associated with handling of chemicals, provision of Personal Protective Equipment (PPE), Eye wash fountains, and drench showers. All the needed First aid Equipment and materials.
D- Pollution Hazards & Controls, effluents, de canting of Hazardous chemicals, gas leaks and fire and explosion caused by Hazardous chemicals.
E- Safe Transfer and storage of Chemicals, Safe Transportation of Chemicals, Inspection, Testing & Maintenance., Hydro testing, Pneumatic testing of vessels and pipelines, acid pickling of equipments & pipelines, Work Permits for Hazardous work. Reports from some Expert Committees.

LABS
Lab1- Storage and Handling of Chemicals. Study of TLV's for different chemicals in
The industry
Lab2- Testing of Instrumentation for safe plant operations, how to test? What are the
Measures you can take to maintain safety.
Lab3- What are the parameters to follow the safety of the drilling, measuring
Pressures etc. And Work Permits issued in Petroleum Rigs

Reference Books:

1. Safety and accident Prevention in Chemical Operations, by Fawcett and Wood, John Wiley & Sons.
2. Major Hazard Control, ILO, Geneva.
3. Safety in Chemical Industries, by Indian Chemical Manufacturers Association, Mumbai-23.

Unit 4: PETRO CHEMICAL INDUSTRIAL SAFETY

- Introduction to chemical industry &inevitable place of chemical industry.
- Need for safety in chemical & petrochemical industry.
- Types of chemical industries.
- Statutory provision and Indian standard.
- Types of chemical hazards &control.
- Material property &hazards &control.
- Pollution hazards &controls.
- Process safety.
- Process hazards &controls.
- Storage hazards &controls.
- Utility hazards &controls.
- Instrumentation for safe plant operations.
- Safe transfer of chemicals.
- Safe transportation of chemicals.
- Inspection, testing and maintenance.
- Worth permits for hazardous work.
- Safety trainings for chemical operation.
- First aid trainings.

Unit5: ROAD AND TRANSPORTAION SAFETY:

Drivers Requirements
Driver Responsibilities , Defence Driving
Motor Vehicle Regulations
Vehicle Conditions
Driver Training
Enforcement of Safe Driving Practice
Road Condition Traffic Signs
Journey Management
D.O.T rules
Route Knowledge of Driver
Working Hours & Dedicated – to Driver
Traffic Safety
Action Taken After Accident
Bad & Good Loading
TREM card
Vehicle Inspection Check Lists
Traffic Monitoring

Laws on Transpiration of Hazardous Goods/ Material
Monitoring of the Road by CC Cameras for each 50 kilometers.(This will create jobs)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

SECOND SEMESTER

4.INDUSTRIAL HYGIENE(Risk Analysis& Risk Management)

Unit1- Introduction to Industrial Hygiene:

Industrial Hygiene:

Definition of Industrial Hygiene, Industrial Hygiene: Control Methods, Substitution, Changing the process, Isolation, Wet method, Local Exhaust Ventilation, Personal hygiene, housekeeping and maintenance, waste disposal, special control measures.

Introduction to chemical Hazards, dangerous properties of chemical, dust, gases, fumes, mist, Vapours, Smoke and aerosols.

Route of entry to human system, recognition, evaluation and control of basic Hazards, concepts of dose response relationship, bio-chemical action of toxic substances.

Concept of threshold, limit values, air sampling strategies, personal exposure monitoring.

Work environment monitoring biological sampling & analysis

Unit-2 Personal Protective Equipment:

Need for personal protection equipment, selection, applicable standards, and supply, use, care & maintenance respiratory and non-respiratory personal protective equipment.

Non-respiratory personal protective devices: Head protection, Ear protection. Face and Eye protection. Hand protection, Foot protection, body protection.

Respiratory personal Protective devices: Classification of Hazards. Classification of

Respiratory personal protective devices. Selection of respiratory personal protective devices

Instructions and training in the use, Maintenance and care of self-contained breathing apparatus. Training in the use of breathing apparatus (open circuits and close unit).

Testing Procedures and Standards.

Unit-3 OCCUPATIONAL HEALTH AND SAFETY:

Definition**:** As per WHO/ILO,History of Occupational Health-Global Perspective and Indian Perspective.,Status of Occupational Health in India,At Central Level, At State Level, At Factory Level

Common Occupational Disease:

Occupations involving risk of contracting these disease - mode of causation of the diseases and its effects - diagnostic methods.

Biological monitoring - Method of prevention Compensation for occupational diseases.

Evaluation of injuries

Occupational Health Management Services at the work place.

Pre-employment, periodic medical examination of workers, medical surveillance for control of occupational diseases and health records.

Fundamental of First-Aid Burns, Fractures, Suffocation, Toxic Ingestion, Bleeding Wounds and Bandaging, Artificial Respiratory Techniques

Occupational Health Hazards:

Adverse health effects of noise, vibration, cold, heat stress, improper illumination, Thermal radiation,Ionising and non-lonising radiations.

Permissible threshold exposure limits - short-term and long term effects of exposures – Preventive and control measures.

Unit-4 INTRODUCTION TO ERGONOMICS PHYSIOLOGY AND ERGONOMICS AT WORK:
Definition, Aims and Scope, Man-machine (Job), Environment System, Constituents of Ergonomics, Application of Ergonomics in industry for
Safety, Health and Environment.
Ergonomics of Automation / Assembly, Visual Fatigue, Ergonomics of Rehabilitation while assigning alternate jobs. Anthrapometry and fundamental of biomechanics: Basic and applied aspects: Anthropometric measurements and their usefulness in industry.
Ergonomic Design of Work Station: Concept of workstation and its design. Improving safety and productivity through workstation design. Technical and engineering control measures. Economics consideration.
Physiology of respiration, cardiac cycle, muscle contraction, nerve conduction system etc. Assessment of Workload based on Human physiological reactions. Permissible limits of load for manual lifting and carrying. Criteria or fixation limits.
Working posture: Its effect on cardio-vascular and musculo-skeletal system and implications on health. Nutrition and its importance in manual work. Nutritional requirements and nutritional of diet.
Assessment of Work Capacity Fatigue and Rest Allowances. Physiological Test for Assessment of Occupational Health. Nutrition: Nutritional requirements and the Diets for Exercise, Work and Physical Fitness.
Aerobic work capacity (physical work capacity), methods of its determination (use of bicycle, ergometer, treadmill, step-stool ergometer). Factors affecting aerobic capacity and work performance. Environment Physiology.

Unit-5:-Hygiene:
Factory act 1948 Health provisions, Def Hygiene, as per AIHGE(USA),
Good House Keeping and cleanliness, Health and Hygiene awareness program for Employees, personal hygienee, Communicable diseases, prevention and control, potable water, washing water, canteen facilities, dinning halls, food preparation facilities and related hygiene, Food contamination and control measures, food handlers hygiene, disinfectants of facilities, maintenance of hygiene.

LABS
Lab 1- Exposure to the injury case studies
Lab 2- Cardiopulmonary resuscitation CPR
Lab 3- First Aid treatment

Reference Books
1. Basic Principles of Industrial Hygiene NSC Chicago
2. Encyclopedia of Occupational Health and Safety (ILO) by Jeanne Mager Stellman
Publisher Ms. Irma Jourdan
3.Accident Prevention Manual for Industrial Operations by Philip E. Hagan publisher National Safety Council

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

SECOND SEMESTER

5.CONFINED SPACE AND WORKING AT DIFFERENT LEVELS

Unit -1 INTRODUCTION TO CONFINED SPACE: Definition, meaning of and classification of confined spaces with examples.

Unit -2 HAZARDS associated with confined space entry and work inside. Precautions to be taken for confined space entry.

Unit -3 CONTROL PROCEDURES to be followed to Prevent possible accidents related to Confined space, and entry permit. Monitoring duties and responsibilities of persons involved in Confined Space work. Safety equipment used while entering and working in the confined space.

Unit -4 TRAINING DETAILS for persons involved in confined space work. Emergency response, Procedure to be followed by Confined Space Working Crew in case of emergency Working at Heights. Working Underground, Working at the same level, Safety against falling bodies.

Unit -5 WORKING AT DIFFERENT LEVELS : Hazards associated with working at different levels, platforms, erection, dismantling and use of scaffoldings, inspection and use of ladders, their types, standards, steps, ramps, elevators and escalators.

LABS

Lab1- How to use gas testing equipment.
Lab2- Develop procedure for Class-A Confined Space entry and work.
Lab3- Demonstration & practice of wearing (donning) a Full Body Harness.

Reference Books:

1. Complete Confined Space Hand Book By John Rekus
2. Industrial Hazard And safety Hand Book By King and majid, Butter Worth
3. Safety in Working at Heights, Issued By DGFASALI Mumbai

----------End of Second Semester----------

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

THIRD SEMESTER

1. FIRE & EXPLOSIONS

Unit1- Definition of FIRE, Nature of Fire, Need of Fire Safety, Chemistry and Pyramid of Fire, Stages of Fire, Spread of fire, factors contributing to Fire, Common Causes of Industrial Fire., Classification of fires (Electrical Fires), Fire extinguishing systems and pitfalls.

Unit2- Standards: Statutory and other Standards, Statutory Provisions, Indian Standards Vs Western standards, Guidance of Regional Tariff Advisory Committee (TAC), NFPA Code.

Unit3- Design for Fire safety: , Fire Resistance of Building materials, Fire Safety of Buildings, Plants, Fire safety and Exit plan, Firefighting Equipment etc, Fire Prevention and Protection Systems, General Control measures, fire Detection and Alarm Systems, Fire Load Determination, Fire Suppression or Extinguishing Systems, portable Fire Extinguishers, Fixed Fire installations- Hydrants, sprinklers, water spray, Foam, Carbon Dioxide, D.C.P and other systems, Automatic Fire Detection & Extinguishing Systems, Control of Fire and Explosion in Flammable substances, Electrical Fires, Effects of Combustion Products, Fire Emergency action plan and Drills.

Unit4- Explosion phenomena: Explosion, Types of explosion, Definition of Implosion, Dust explosion, Deflagration, Detonation, Confined and Unconfined Vapour Cloud Explosion (VCE).Boiling liquid expending vapor explosion (BLEVE) Terrorist attacks and Firefighting

Unit5- Inspection, Maintenance and Training for Fire Protection. Some Major Fire Incidents, Worked Examples. Health Hazards due to Fire accidents (Burns)

LABS

Lab1- Demonstration of different classes of fire.
Lab2- Demonstration & practice in the use of Portable Fire Extinguisher.
Lab3- Demonstration & practice of Emergency Rescue of Fire/gas affected victim, treatment of burns due to Fire accidents.

Reference Books:

1. Accident prevention Manual for Industrial Prevention N.S.C. Chicago
2. Fire protection Manual Factory Manual Systems H.M.S.O London
3. Flammable Hazardous Materials By James. H. MEDIL.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

THIRD SEMESTER

2. INDUSTRIAL PSYCOLOGY AND BEHAVIOURAL MODIFICATIONS

Unit-1 Organisational behavior- Definitions, fundamentals of organizational behavior, dynamics of people and organisartion. Theoretical frame works, models and approaches of organizational behavior.

Unit – 2 Individual in the organization – Social perception, learning, personality, abilities, motivation, attitudes, job satisfaction, commitment prejudice.

Unit -3 Group processes, Influencing others – Socialization, careers, group dynamics, team work, communication, decision making, pro social and deviant behavior, influence, power and politics in organizations, leadership.

Unit – 4 Organizational processes – culture, structure, design, technology, strategic planning and organizational development, change, career development, communication, Diversity ethics, across cultures, teams, change professional competencies, human resources management employee problems.

Unit -5 Health issues- Health psychology, enhancing Health preventing illness and illness and medical treatment, stress conflict management counseling behavior modification, coping, management of ill and yoga.

LABS

Case Study:-1
Case Study:-2
Case Study:-3

Reference Books:

1. Behaviour Modification: Principles and Procedures 5th Edition by Raymond G. Miltenberger
2. Occupational Psychology by Gail Steptoe-Warren
3. The Psychology of People in Organisations by Melanie Ashleigh, Angela Mansi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

THIRD SEMESTER

3. ACTS, LAWS, LEGISLATION, (OSHA) & STANDARDS

Unit1- Factory Act 1948, (amended 1987 and 2001) and corresponding safety rules and regulations, Mining Act 1952 (amended 1984), Mines rules and regulations metallic - ferrous mines regulation, Electricity Act 2003, Drugs & Cosmetic Act 1955, Petroleum Act 1934, Dock Workers Act (Safety Health and Welfare) Act 1986 , Boilers Act 1923, (amended 1950) Explosives Act 1984 .

Unit2- Factory Act 1948 (amended 1987 and corresponding state rules) Laws on Boiler Safety, Laws on Electrical Safety, Indian Boilers Regulations 1950 (amended 1997), Boiler Rules, the explosive act 1980 (amended 1983), the explosive rules, the static and mobile pressure vessel rules, the gas cylinder rules (2004) Laws on Fire & Explosion Safety.
Statutory clearness safe operations:- 1. Director General of Mines Safety (DGMS) 2. PESO 3.Central Pollution Control Board(CPCB) and State PCB

Unit3- The petroleum act 1934, the petroleum rules 2002, the calcium carbide rules 1987, the cinema autograph film rules 1948, the inflammable substances act 1952, Laws on Insecticides & pesticides (Toxic Chemicals)

Unit4- The electricity act 2003 (The relating to generation, transmission, distribution, trading, and use of electricity) , protecting the interests of consumers and supply of electricity to all areas, rationalization of electric tariff, promotion of efficient and environmentally benign policy, regulatory commissions and establishment of appellate tribunal, Laws on Atomic Energy & Radiation. ESI Act of 1948.

Unit5- The water act (prevention of control of pollution) Act 1974 and water rules, the air (prevention and control of pollution) Act 1981 (amended 1987), air rules, environmental protection act 1986, Hazardous waste management act 2005, the building and other construction workers act 1996, the public liability insurance act 1991 (amended 1992), Disaster management act 2005. Laws on Transportation Safety, Laws on Construction Safety, Laws on Dock Safety, Laws on Lifts & Escalators.

LABS
Case Study 1
Case Study 2
Case Study 3

Reference Books:

1. Factories Act, 1948 (With Latest Amendments Indian Standards (B.S.I)
2. All the Relevant Acts, Laws applicable (25 No) to Industrial Safety and Health
3. I.L.O's Conventions & Recommendations applicable to occupational Health and Safety Geneva.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

THIRD SEMESTER

4. Hazard Analysis &Risk Assessment

Unit-1:- Hazard and risk identification assessment and control techniques:-

Identification to Hazard & Risk Safety appraisal, analysis and control techniques objectives, safety appraisal system, damage control, total loss control, job safety analysis, safety inventory system, product safety, safety work permit, standard operating procedures (SOPS), critical incident review system , incident recall technique, procedural analysis, methodical analysis, technique for human error prediction (THERP) PERT and CPM, safety codes and standards including ISO 14001 and OSHA 18001.

Unit-2:- Plant safety inspections & Audits:-

Definition and objectives, types & procedures, non destructive testing (N.D.T), safety check lists, safety surveys, safety tour, safety study, safety review, safety sampling, good manufacturing practices (G.M.P), recommendations & follow up actions (compliance) responsibility for inspections. Definition of Audits, Difference between Audits and Inspection, Internal audits, external audits, audit plan, audit meetings, audit report and closeout

Unit-3:- Accident investigations, Analysis Reporting:-

Philosophy, purpose of investigations & report, process and types of investigations, agencies investigating the accidents, accident analysis (Classification) industrial classification(NIC 1987) , Accident investigation report & its content, methods of collecting and tabulating data, follow up for corrective action, record keeping.

Unit- 4:- Hazard and Risk Assessment:-

Definition of Hazard & risk with examples, Hazard and risk detection techniques, Hazard and risk progression chart, risk analysis, assessment and management, preliminary Hazard analysis (PHA) & Hazard analysis(HAZAN), failure made and effect analysis (FMEA), Hazard and operability (HAZOP) study, Hazard Rating, Fault. Tree analysis (F.T.A), Event Tree Analysis(E.T.A) Accident or cause sequence analysis, Maximum Credible Accident Assessment (MCAA), Vulnerability Analysis and 'What if ' analysis, Engg.

Unit-5:- Major Accident Hazard Control (MAH):

- Concept of Major Accident (MAH), types and consequences of MAH, criteria (identification) for plant to be under MAH unit, Role of Management, role of Authorities, Role Of Workers Public Role of Public, Safe Reports, Safety Audit Reports And Risk Assessment Reports need and types of Emergency Plans, Statutory provisions, Onsite Emergency plan, offsite Emergency Plan.

LABS

Labs1. Case Study Hazard Identification and ssesment
Lab 2. Case Study Accident Hazard and its measures
Lab 3. Case Study of Prevention of Plant safety precationary measures

Reference Books:

1. Risk assesment Theory Methods and applications, By Marvin Rausand
2. Risk Assesment Tools Tehnics and applicatiions., By Lee T. Ostrom
3. System Safety Engineering and Risk Assesment, By Nicholas J. Bahr

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

THIRD SEMESTER

5 ILO'S, CONVENTIONS & RECOMMENDATIONS AND INTERNATIONAL STANDARDS, GUIDELINES ON OH&S

Unit-1 Introduction to ILO, Origins and History , the member countries, UN agency, Labor Standards, The ILO was founded in 1919, in the wake of a destructive war, to pursue a vision based on the premise that universal, lasting peace can be established only if it is based on social justice. The ILO became the first specialized agency of the UN in 1946.The only tripartite U.N. agency, since 1919 the ILO brings together governments, employers and workers representatives of 187 member States , to set labor standards, develop policies and devise programs promoting decent work for all women and men

The International Labor Organization (ILO) is devoted to promoting social justice, and internationally recognized human and labor rights, pursuing its founding mission that social justice is essential to universal and lasting peace.

tripartite U.N. agency, the ILO brings together governments, employers and workers representatives of 187 member States , to set labor standards, develop policies and devise programs promoting decent work for all women and men. ILO's Decent Work agenda helps advance the economic and working conditions that give all workers, employers and governments a stake in lasting peace, prosperity and progress.

Unit-2 How ILO woorks and ILO'S conventions and recommendations, explanation

Tripartism and social dialogue, Main bodies, employers' and workers' representatives, International labor Conference ,Governing body the International Labor, Office Director-General ,Regional meetings . Strategic Policy framework, Program and Budget, Programme Implementation Report, Management and Evaluation,

Unit-3 International standards on quality and safety, Indian standards on quality and safety.Standards supervisory system, ILO supervisory system, The regular system of supervision, Special procedures, The regular system for supervising the application of standards, The regular system of supervision, application in law and practice sent by member States and on observations in this regard sent by workers' organizations and employers' organizations, The Committee of Experts on the Application of Conventions and Recommendations , The International Labor Conference's Tripartite Committee on the Application of Conventions and Recommendations , General Surveys, Technical assistance and training, Relevant constitutional provisions

Unit-4 ISO : What is ISO, why ISO is needed?, What are the benefits of ISO International Standards?, Preview ISO standards, ISO Standards in action, ISO and Consumers, Conformity assessment, Developing countries, Education & Training, SMEs, Services ISO9001, ISO18001 and ISOISO 14001.

Unit-5 Internationally accepted/ practices on Occupational Health & Saftey, Fundamental principles of occupational safety and health , Occupational Health team, Occupational Health set up, Selected relevant ILO instruments, Health and safety in particular branches of economic activity, Protection

against specific risks, Codes of Practice, Further information, Building a preventative safety and health culture , employer duties under OSHA, workers' compensation, operational challenges, Pre Employment health evaluation, post injury evaluation and certificate of fitness for re join to the work, Urine testing for drugs,breath alchol testing etc. Conclusion.

Labs 1, 2 & 3: Case studies of the different conventions, seminars and expert Talks at UNO/ ILO, Geneva.

Books;

1. Programme for local economic development through enhanced governance and grassroots empowerment (PLEDGE): Project fact sheet

2. Water is life: Repair of community potable water system and reforestation of community-managed watershed in Pinabacdao, Samar

3. Decent work for seafarers and fair competition in shipping: Programme fact sheet

End of the Third Semester

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

MS ENVIRONMENT OCCUPATIONAL HEALTH & SAFETY

FOURTH SEMSTER

PROJECTS

1. Power plants & disaster
2. Present industrial scenarios
3. Epidemiology of Occupational Health
4. Safety of the residents living around the Hazardous substance manufacturing factories
5. Occupational diseases – Agricultural, Chemical, Solid Particles, Gaseous, Health screening Methods, ESI Hospital and Workers Health., Physical Injuries & Burns, Industrial accidents
6. Industrial house Keeping
7. Hazardous Materials and Recycling
8. Agro Occupation Hazards
9. Disaster Management (Wild Fires, Earth Quake, Gas Leaks, Tsunami, Floods etc.,
10. Shipping Industry and Hazards
11. Oil and Gas Industry upstream and downstream safety
12. Incident Investigation and Reporting
13. Permit to work system
14. Hazard Identification and Risk Assessment
15. Audits and Inspections
16. Industrial hygiene
17. Safety in paints and pigments.
18. Safety in fire cracker industry
19. Safety in pharmaceutical industry.
20. Safety in Heavy chemicals
21. Safety Management
22. A study on job safety Analysis (JSA)
23. Safety in material handling other than manual material handling
24. A study on machine guarding
25. Hazard operability and Hazard analysis Study
26. Effluent Treatment in different industries and how do you save and re use
27. Safety involving work in Confined Space
28. Safety in storage, Handling and Transportation of Hazard materials
29. A study on Fire prevention System in Industries
30. A study on personal protective equipment
31. Industrial accidents – Causes & Controls