

GUJARAT TECHNOLOGICAL UNIVERSITY

Environmental Engineering (17)

INDUSTRIAL HYGIENE & SAFETY

SUBJECT CODE: 2721711

M.E. 2nd SEMESTER

Type of course: Occupational Health and Safety

Prerequisite: knowledge regarding health hazards and use of Personal Protective Equipment

Rationale: The graduate engineer employed in Safety Health & Environment (SHE) department of industry requires knowledge of matters related human health risks and their mitigations

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T/P	P		Theory Marks		Tutorial/ Practical Marks				
			ESE (E)		PA (M)		ESE (V)		PA (I)	
							ESE	OEP	PA	RP
3	2	2	5	70	30	20	10	10	10	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment; OEP-Open Ended problem; AL-Active learning;

Learning Objectives:

- To educate about the industrial hygiene, health hazards and the safety measures to be followed in the industrial environment.

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction to Occupational Health: Objectives, Classification of occupational health hazards, dangerous properties of chemical and their health effects, routes of entry of toxic material into human body, permissible exposure limits, Threshold limit value, lethal dose and lethal concentration.	8	20
2	Safety Engineering: Concept of safety, safety Terminology, Accident problem, Reasons for prevention, factors impending safety, Accident prevention.	6	15
3	Safety Management: Concept of management, element of management, functions, management principles, safety management & its responsibilities, safety organization.	6	15
4	PPE, electrical and Fire safety: Need of PPE, Indian standards, factors of selection of PPE, non respiratory equipments, respiratory equipments, Electricity and Hazardous, Indian standards, effects of electrical parameters on human body, safety measures for electric works, Fire phenomena, classification of fire and extinguishers, fire prevention & protection system.	8	20
5	International Standards For Environmental management: Basic Information of below topics like :	6	15

Sr. No.	Content	Total Hrs	% Weightage
	ISO – 14000 s Introduction to ISO and ISO 14001, 2, 3, 4, 5 Etc. ISO 14000 – 14009 : Environmental Management Systems ISO 14010 – 14019 : Environmental Audit ISO 14030 – 14039 : Environmental Performance Evaluation		
6	Risk identification and Risk Assessment, hazard analysis (HAZAN) study, HAZOP Study.	6	15

Reference Books:

1. Hand Book for Safety Managers by American Management Association
2. Encyclopedia for Occupational Health published by International organization UNO.
3. Industrial safety By Dr.K.U. Mistry
4. Occupational Health, a Practical Guide for Managers -by Ann Fingret and Akin Smith.
5. Environmental Health & Technology - by Y P Kudesia & Ritu Kudesia.
6. Environment & Health by Norman M Triff.

Course Outcome: After successful completion of the course the students shall be able to

- Identify the disease associated with occupation
- Identify the hazards in industrial operation and propose prevention measures.
- Carry out hazop and hazan analysis

List of Experiments:

1. Exercise on the data collection for different occupational where human interaction with inbuilt and outdoor environment.
2. Exercise on the safety related norms and other provisions
3. Occupational risk analysis and accidental events
4. Occupational exposure to disease causing materials
5. Safety norms for different occupations and industry
6. Field visit of industry, trade and professional organisation
7. Report preparation for exposures to risk with specific case study of related branch
8. Presentation of report to the continuous assessment committee

Design based Problems (DP)/Open Ended Problem: N.A

List of Open Source Software/learning website:

- <http://elearning.vtu.ac.in/>
- www.nptel.iitm.ac.in/courses/