GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3141310

Semester – IV
Subject Name: Occupational Health and Safety

Type of course: Professional Core Course

Prerequisite: --

Rationale: To learn about the health problems associated with occupations and safety aspects of workers

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	1	0	4	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs	% Weightage
(A)	**OCCUPATIONAL HEALTH**		
1	Classification of occupational health hazards, routes of entry of toxic material into human body, dangerous properties of chemical and their health effects, permissible exposure limits, Threshold limit value, lethal dose and lethal concentration, Ergonomics, constituents of ergonomics, application of ergonomics for safety & health, occupational diseases due to metals & dusts, fumes & chemical compounds.	9	20%
(B)	**SAFETY**		
1	**Concept, Philosophy & Psychology of safety:** Concept of safety, Nature of concept of safety, Philosophy of safety, safety terminology, philosophy of total safety concept, safety psychology, accident causative factors, general psychological factors.	4	10%
2	**Safety Management:** Concept of management, element of management, functions, management principles, safety management & its responsibilities, safety organization	4	10%
3	**Accident Causes and prevention:** Causation, Accident problem, Reasons for prevention, factors impending safety, accident prevention	4	10%
4	**Electrical Safety:** Electricity and Hazardous, Indian standards, effects of electrical parameters on human body, safety measures for electric works	4	10%
5	**Fire & Explosion:** Fire phenomena, classification of fire and extinguishers, statutory and other standards, fire prevention & protection system, explosion phenomena, explosion control devices, fire awareness signs	4	10%
6	**Personal Protective Equipment:** Need of PPE, Indian standards, factors of selection of PPE, non-respiratory equipments, respiratory equipments.	4	10%
7	**Hazards & Risk Identification, Assessment & Control Techniques:** Hazards, Risks & detection techniques, Preliminary hazard analysis (PHA) & hazard analysis (HAZAN), failure mode effect analysis (FMEA), Hazard and operability (HAZOP) study, Hazard ranking (DOW & MOND index), Fault tree analysis, Event tree analysis (ETA), major accident hazard control, on-site and off-site emergency plans.	9	20%

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	25	15	10	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Fundaments of Industrial safety & health by Dr. K. U. Mistry.
2. Industrial Safety & Environmental Management System R. K. Jain & Prof. Sunil S. Rao, Publisher: Khanna Publishers
3. Social & Preventive Medicines by Yashpal Bedi.
4. Industrial & occupational Safety, Health & Hygein - by AHommadi.
5. Occupational Health, a Practical Guide for Managers -by Ann Fingret & Akin Smith.
6. Environmental Health & Technology - by Y P Kudesia & Ritu Kudesia.
7. Environment & Health by Norman M Triff

Course Outcomes:

Sr. No.	CO statement	Marks Weightage
CO1	Recognize the occupational health related hazards in the workplace	20%
CO2	Understand the Concept, Philosophy & Psychology for safety management	20%
CO3	Discuss Electrical safety, fire & explosions, accidental hazards and PPE	40%
CO4	Explain Hazards & Risk Identification, Assessment & Control Techniques	20%

List of Tutorials:

1. Occupational Health
2. Concept, Philosophy & Psychology of safety
3. Safety Management
4. Accident Causes and prevention
5. Electrical Safety
6. Fire and Explosion
7. Personal Protective Equipment
8. Hazards & Risk Identification, Assessment & Control Techniques