

M. Tech II Semester III

Subject Name : Industrial Safety

Subject Code: MTST15301

Type of course: OE

Prerequisite: Nil

Rationale: Safety is major issue in any industry; awareness about safety helps students from any major accidents, Different rules regulation of safety helps students apply it in industry for performance and productivity improvements. Knowledge of Maintenance, its type and application gives better work environments and helps industry from major shutdown. Different maintenance tools and techniques for different situation and industry equipment's help students to apply it in real life industry problems.

Teaching and Examination Scheme:									
TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	00	00	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination.

Content:

Sr. No.	Content	Teaching Hrs.	Module Weightage
1	Industrial safety: Accident, causes, types, results and control, mechanical and electrical hazards, types, causes and preventive steps/procedure, describe salient points of factories act 1948 for health and safety, wash rooms, drinking water layouts, light, cleanliness, Safety color codes.	6	10
2	Fundamentals of maintenance engineering: Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment	8	20
3	Hazardous zones: Classification of hazardous zones-intrinsically safe and explosion proof electrical apparatus-increase safe equipment-their selection for different zones-temperature classification-grouping of gases-use of barriers and isolators-equipment certifying agencies	5	10
4	Periodic and preventive maintenance: Periodic inspection-concept and need, degreasing, cleaning and repairing schemes, overhauling of mechanical components, overhauling of electrical motor, common troubles and remedies of electric motor, repair complexities and its use, definition, need, steps and advantages of preventive maintenance. Steps/procedure for periodic and preventive maintenance of: I. Machine tools, ii. Pumps, iii. Air compressors, iv. Diesel generating (DG) sets, Program and schedule of preventive maintenance of mechanical and	10	20

OE: Open Elective

	electrical equipment, advantages of preventive maintenance. Repair cycle concept and importance		
5	Fire Protection and Prevention: Sources of ignition –fire triangle –principles of fire extinguishing –active and passive fire protection systems –various classes of fires –A, B, C, D, E –types of fire extinguishers –fire stoppers –hydrant pipes –hoses – monitors –fire watchers –lay out of stand pipes –fire station–fire alarms and sirens –maintenance of fire trucks –foam generators –escape from fire rescue operations –fire drills –notice–first aid for burns	8	20
6	Safety from electricity and fire: Primary and secondary hazards–shocks, burns, scalds, falls–human safety in the use of electricity, Personal Protective equipments(PPE’s)used in connection with safe use of electricity like Hand Gloves, Rubber Shoes, Waist belt, earthing rod, goggles etc, Safe working clearances for different voltage levels, fire extinguishers used for different applications, knowledge of Static electricity, Lightning protection, Electrical Safety Audit, elementary knowledge of first aid	8	20

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
30	30	20	10	05	05

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **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 Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Maintenance Engineering Handbook	Higgins & Morrow	Da Information Services		
2.	Maintenance Engineering	H. P. Garg	S. Chand and Company		
3.	Handbook of fire protection engineering	K. Ehteshami	Khanna Publication	2019	
4	Fundamentals of Industrial safety and health	Dr. K. U. Mistry	Siddharth Prakashan		
5	Electrical Installation in Hazardous area	Allan Mcmillan	Elsevier	1998	
6	Electrical Safety, Fire Safety Engineering and Safety Management	Prof. Sunil S. Rao, R.K. Jain and Prof. H.L. Saluja	Khanna Publication	1997	

OE: Open Elective

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Understand Importance of Safety and Important related Acts. (<i>R, Ucognitive level</i>)	15
CO-2	Apply Maintenance techniques as per requirements and able to compare for with different technique for better performance. (<i>R, U, A.....cognitive level</i>)	30
CO-3	Understand Fire protection and prevention. (<i>R, U.....cognitive level</i>)	25
CO-4	Explain the objectives and precautions of Electrical Safety, effects of Shocks and their Prevention. (<i>R, U, C.....cognitive level</i>)	20
CO-5	Understand electrical installation in hazardous area. (<i>R, U, C.....cognitive level</i>)	10