



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: ALL

Course / Subject Code : BE02000061

Subject Name : Industrial Safety and Standards

WEF Academic Year :	2024-25
Semester :	2
Category of the Course :	MOPEC

Prerequisite :	High School Physics, Chemistry, Mathematics
Rationale :	The course is intended to give knowledge of various safety management principles, various safety systems, hazards, types, causes and preventive steps in an industrial environment. It will prepare the students to understand the importance of periodic and preventive maintenance in an industrial environment and to find faults in various machine tools.

Course Outcome :

After Completion of the Course, Student will able to :

No	Course Outcomes	RBT Level*
01	Understand the concept of industrial safety and industrial hazards	UN
02	Understand the importance of Periodic and Preventive maintenance	UN
03	Apply the fault finding methods in machine tools	AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Teaching Scheme and Examination Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
2	0	0	2	70	30	0	0	100



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Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Unit-I: Industrial safety: Need for safety. Safety and productivity, Accident: causes, types, results and control. Injury, Unsafe act, Unsafe Condition, Dangerous Occurrence, Reportable accidents. Theories of accident causation. Mechanical and electrical hazards: types, causes and preventive steps/procedure, describe salient points of factories act 1948 for health and safety, washrooms, drinking water layouts, light, cleanliness, fire, guarding, pressure vessels, etc, Safety color codes. Monitoring Safety Performance: Frequency rate, severity rate, incidence rate, activity rate. Safety policy and safety standards for Industry and organization.	8	20
2	Unit-II: Hazard identification and analysis: Hazard and risk, Types of hazards –Classification of Fire, Types of Fire extinguishers, fire explosion and toxic gas release, Structure of hazard identification and risk assessment. Identification of hazards: Inventory analysis, Fire and explosion hazard rating of process plants - The Dow Fire and Explosion Hazard Index, Preliminary hazard analysis, Hazard and Operability study (HAZOP)) – methodology, criticality analysis, corrective action and follow-up. Control of Chemical Hazards, Hazardous properties of chemicals, Material Safety Data Sheets (MSDS)	4	10
3	Unit-III: 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.	4	10
4	Unit-IV: Wear and Corrosion and their prevention: Wear- types, causes, effects, wear reduction methods, lubricants-types and applications, Lubrication methods, general sketch, working and applications, Definition, principle and factors affecting the corrosion. Types of corrosion, corrosion prevention methods.	4	20
5	Unit-V: Fault tracing: Fault tracing-concept and importance, decision tree concept, need and applications, sequence of fault finding activities, Types of faults in machine tools and their general causes.	4	20



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6	Unit-VI: 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 electrical equipment, advantages of preventive maintenance. Repair cycle concept and importance.	6	20
Total		30	100

Reference Book :

1. Maintenance Engineering Handbook, Higgins & Morrow, Da Information Services.
2. Maintenance Engineering, H. P. Garg, S. Chand and Company.
3. R.K Jain (2000) Industrial Safety, Health and Environment management systems, Khanna Publications.
4. Paul S V (2000), Safety management System and Documentation training Programme handbook, CBS Publication.
5. Krishnan, N.V. (1997). Safety management in Industry. Jaico Publishing House, New Delhi.
6. John V. Grimaldi and Rollin H.Simonds. (1989) Safety management. All India Traveller Book Seller, Delhi.

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