INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

INDUSTRIAL SAFETY								
III Semester: STE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
BSTE32	**Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	0	3	40	60	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisite: NIL								

I. COURSE OVERVIEW:

Industrial Safety focuses on the principles, practices, and regulations required to ensure safe working environments in industrial operations and processes. This course provides an overview of occupational hazards, accident causation, and safety management systems in line with national and international standards. It emphasizes risk assessment, hazard identification, and preventive strategies by integrating modern safety tools, monitoring technologies, and regulatory frameworks. Topics include industrial hazards and their control, fire and explosion prevention, electrical and mechanical safety, ergonomics, personal protective equipment (PPE), safety in material handling, emergency preparedness, and accident investigation.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The fundamentals of industrial hazards, risk assessment, and accident causation theories, and their importance in ensuring workplace safety and sustainable industrial operations.
II. Different safety systems, hazard control measures, and emergency preparedness strategies, including their effectiveness, regulatory requirements, and technological applications.
III. Principles of occupational health, safety management systems, and modern monitoring tools to prevent accidents, ensure compliance, and promote safe working environments.
IV. Case studies of industrial accident investigations, disaster management, and safety audits to identify best practices, challenges, and strategies for improving industrial safety performance.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1 Identify causes, types, and control measures of accidents for understanding mechanical and electrical hazards.
CO 2 Analyze fire prevention methods, firefighting equipment, and safety color codes for minimizing workplace hazards and ensuring emergency preparedness.
CO 3 Evaluate maintenance engineering fundamentals, maintenance types, and cost–replacement relations for improving equipment service life and plant reliability.
CO 4 Apply knowledge of wear mechanisms, lubrication methods, and corrosion prevention techniques for enhancing durability and reducing industrial component failures.
CO 5 Utilize hazard identification and risk assessment techniques such as JSA, FMEA, HAZOP, Fault Tree, and Event Tree analyses for systematic safety evaluation and risk mitigation.
CO 6 Implement periodic and preventive maintenance practices for effective inspection and long-term operational efficiency of mechanical and electrical systems.

IV. COURSE CONTENT:

MODULE –I: INDUSTRIAL SAFETY (9)
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, fire, guarding, pressure vessels, etc, Safety color codes. Fire prevention and firefighting, equipment and methods.

MODULE -II: FUNDAMENTALS OF MAINTENANCE ENGINEERING (9)
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.

MODULE -III: WEAR AND CORROSION AND THEIR PREVENTION (9)
Wear- types, causes, effects, wear reduction methods, Lubricants - types and applications, Lubrication methods, general sketch, working and applications, Screw down grease cup, Pressure grease gun, Splash lubrication.

Definition, principle and factors affecting the corrosion. Types of corrosion, corrosion prevention methods.

MODULE -IV: HAZARD IDENTIFICATION TECHNIQUES (9)
Job Safety Analysis-Preliminary Hazard Analysis-Failure mode and Effects Analysis- Hazard and Operability-Fault Tree Analysis- Event Tree Analysis Qualitative and Quantitative Risk Assessment Checklist Analysis-Root cause analysis- What-If Analysis- and Hazard Identification and Risk Assessment.

MODULE -V: PERIODIC AND PREVENTIVE MAINTENANCE (9)
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.

V. TEXTBOOKS:

1. Reese, Charles D., and James Vernon Eidson. "*Handbook of OSHA construction safety and health*." crc press, 2006.
2. Higgins, Lindley R., R. Keith Mobley, and Darrin Wikoff. "*Maintenance engineering handbook"*. McGraw-Hill Education, 2008.

VI. REFERENCE BOOKS:

1. R.K. Jain and Prof. Sunil S. Rao, "*Industrial Safety, Health and Environment Management Systems*" Khanna Publisher.
2. Frank Lees "*Loss Prevention in Process Industries"*. Butterworth-Heinemann publications, UK, 4th Edition, 2012.

VII. ELECTRONICS RESOURCES:

1. https://nibmehub.com/opacservice/pdf/read/Industrial%20Safety%20and%20Health%20Management.pdf.
2. https://hsseworld.com/wp-content/uploads/2020/08/Industrial-Safety-Management.pdf.

VIII. MATERIAL ONLINE:

1. Course Outline Description
2. Tutorial Question Bank
3. Assignments
4. Model Question Paper – I
5. Model Question Paper - II
6. Lecture Notes
7. Early Lecture Readiness Videos
8. Power point presentation