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

COURSE CONTENT

INDUSTRIAL SAFETY								
III Semester: OE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BPSE33	**Elective**	3	-	-	3	40	60	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisite: -								

I. COURSE OVERVIEW:

This course provides a comprehensive understanding of **Industrial Safety and Maintenance Engineering**, focusing on ensuring operational safety, reducing equipment failures, and extending service life. It covers key topics including industrial hazards and accident prevention, maintenance types and strategies, corrosion and wear prevention, fault diagnosis in engineering systems, and preventive maintenance procedures. Students will learn practical techniques and methods for effective equipment management, safety compliance, and performance optimization in industrial environments.

II. COURSES OBJECTIVES:

The students will try to learn

I. About industrial hazards, accident prevention strategies, and statutory safety measures under the Factories Act, 1948.
II. The engineering principles, fault tracing techniques, and methods for effective machinery upkeep.
III. The causes of corrosion and wear, and explore practical preventive and lubrication techniques for equipment longevity.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1 Identify and assess industrial hazards (mechanical and electrical), their causes and control methods, and explain fire prevention and firefighting techniques.
CO2 Explain the functions and responsibilities of a maintenance department and categorize types of maintenance and their applications.
CO3 Analyze wear and corrosion problems, apply suitable lubrication and prevention techniques to reduce degradation of mechanical systems.
CO4 Use fault tracing methods, including decision trees, for diagnosing and rectifying faults in machine tools, engines, compressors, and electrical systems.
CO5 Plan and implement periodic and preventive maintenance schedules for mechanical and electrical equipment like pumps, DG sets, and compressors.
CO6 Comprehend and apply safety standards, color codes, and provisions of the Factories Act, 1948 to enhance health and safety in the industrial workplace.

COURSE CONTENT:

MODULE - I: INDUSTRIAL SAFTEY (09)

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, fire, guarding, pressure vessels, etc, Safety color codes. Fire prevention and firefighting, equipment and methods.

MODULE–II: MAINTENANCE ENGINEERING (09)

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.

MODULE –III: CORROSION AND PREVENTION TECHNIQUES (10)

Wear and Corrosion and their prevention: Wear- types, causes, effects, wear reduction methods, lubricants- types and applications, Lubrication methods, general sketch, working and applications, i.e. Screw down grease cup, ii. Pressure grease gun, iii. Splash lubrication, iv. Gravity lubrication, v. Wick feed lubrication vi. Side feed lubrication, vii. Ring lubrication.

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

MODULE –IV: FAULT TRACING (10)

Fault tracing: Fault tracing-concept and importance, decision tree concept, need and applications, sequence of fault finding activities, show as decision tree, draw decision tree for problems in machine tools, hydraulic, pneumatic, automotive, thermal and electrical equipment's like, I. Any one machine tool, ii. Pump iii. Air compressor, iv. Internal combustion engine, v. Boiler, vi. Electrical motors, Types of faults in machine tools and their general causes.

MODULE –V: PERODIC AND PREVENTIVE MAINTENANCE (10)

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.

V TEXTBOOKS:

1. Higgins & Morrow, "Maintenance Engineering Handbook", Da Information Services.
2. H. P. Garg, "Maintenance Engineering", S. Chand and Company.

VI. REFERENCE BOOKS:

1. Audels, "Pump-hydraulic Compressors", Mcgraw Hill Publication.
2. Winterkorn, Hans, "Foundation Engineering Handbook", Chapman & Hall London.

VII. ELECTRONICS RESOURCES:

1. http://portal.unimap.edu.my/portal/page/portal30/Lecturer%20Notes/KEJURUTERAAN_KOMPUTER/Semester%201%20Sidang%20Akademik%2020142015/DPT333%20Industrial%20safety%20and% 20health/Chapter%201%20-%20Introduction%20-Zaizu_0.pdf

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Definition and terminology
4. Tech Talk Topics
5. Assignments
6. Model question paper-I
7. Model question paper-II
8. Lecture notes
9. Power point presentations