

# LESSON PLAN

**Branch:** B.Tech in Biotechnology

**Semester:** 6th

**Subject:** MCMC3002 – Industrial Safety Engineering

**No. of Days/Week:** 3

**Semester Duration:** Dec 2025 – April 2026

**No. of Weeks:** 16

**Name of the Teaching Faculty:** Dr. Susmita Mahapatra

Week	Class Day	Theory Topics
1st	1st	Introduction to industrial safety: concept, scope, importance in industries and role of safety engineering
	2nd	Industrial accidents: definition, types, causes and classification of accidents
	3rd	Consequences of accidents: injuries, fatalities, economic losses and preventive strategies
2nd	1st	Mechanical hazards: types, causes and safety measures
	2nd	Electrical hazards: shock, short circuit, arc, preventive measures
	3rd	General safety procedures and use of personal protective equipment (PPE)
3rd	1st	Factories Act, 1948: key provisions related to health, safety and welfare
	2nd	Workplace safety requirements: ventilation, lighting, cleanliness, drinking water and sanitation
	3rd	Safety color codes and industrial safety signs
4th	1st	Fire hazards: classification of fire and causes
	2nd	Fire prevention methods and safety protocols
	3rd	Firefighting equipment: extinguishers, hydrants and operation methods
5th	1st	Fundamentals of maintenance engineering: definition and objectives
	2nd	Functions and responsibilities of maintenance department
	3rd	Types of maintenance: breakdown, preventive and predictive
6th	1st	Maintenance tools and equipment: types and applications
	2nd	Maintenance cost analysis and replacement economy
	3rd	Service life of equipment and reliability concepts
7th	1st	Wear: types (abrasive, adhesive, fatigue), causes and effects
	2nd	Methods to reduce wear and improve machine life
	3rd	Lubricants: types, properties and industrial applications
8th	1st	Lubrication methods: gravity, splash, pressure and wick feed systems
	2nd	Detailed working of lubrication devices (grease gun, oil systems)
	3rd	Industrial applications of lubrication systems
9th	1st	Corrosion: definition, electrochemical principles and factors affecting corrosion
	2nd	Types of corrosion: uniform, galvanic, pitting, stress corrosion
	3rd	Corrosion prevention methods: coatings, cathodic protection, inhibitors
10th	1st	Fault tracing: concept and importance in maintenance engineering
	2nd	Decision tree method for fault diagnosis
	3rd	Fault tracing in machine tools with examples

11th	1st	Fault tracing in pumps, compressors and engines
	2nd	Fault analysis in thermal systems (boilers)
	3rd	Fault tracing in electrical motors
12th	1st	Preventive maintenance: definition, need and objectives
	2nd	Steps involved in preventive maintenance programs
	3rd	Advantages and limitations of preventive maintenance
13th	1st	Periodic inspection: concept and importance
	2nd	Cleaning, degreasing and repair procedures
	3rd	Overhauling of mechanical components
14th	1st	Overhauling of electrical motors and systems
	2nd	Common motor faults and troubleshooting techniques
	3rd	Repair complexities and maintenance planning
15th	1st	Preventive maintenance of industrial equipment (machines, pumps, compressors)
	2nd	Maintenance scheduling and planning
	3rd	Case studies in industrial safety and maintenance failures
16th	1st	Revision of all modules and key concepts
	2nd	Discussion of practical problems and safety case analysis
	3rd	Doubt clearing and viva preparation