



Subject: Industrial Safety – III- MSCIN13514

Type of course: Major

Prerequisite: Industrial safety is critical to ensuring the well-being of workers, preventing accidents, and maintaining compliance with regulations in various industries, such as manufacturing, construction, petrochemicals, and more. Before working in an industrial environment, individuals must be equipped with fundamental safety knowledge and skills.

Rationale: The most fundamental reason for industrial safety is to protect workers from potential hazards in the workplace. Workers in manufacturing plants, construction sites, laboratories, and chemical facilities are exposed to various dangers, such as toxic chemicals, machinery and environmental risks.

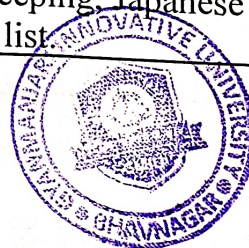
Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	0	4	60	30	10	00	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Unit No.	Course content	Hrs	% Weight age
1	Plant design, layout, material handling and housekeeping:- Introduction of plant sighting, plant layout, sight layout, plot layout, equipment layout, control rooms, pipe work and storage layout, introduction of housekeeping, housekeeping and safety, methods and management of good housekeeping, Japanese concept of “Five S”, inspection and check list	15	25



2	Machine tool, hand tool and power tool for safety and machine guarding:- Introduction, classification and important aspects of machine tools, hand tools and power tools.	15	25
3	Electrical safety and static electricity:- Introduction of flammable gases, affected criteria in electrical safety system, introduction of static electricity, ground fault circuit protection, electric work in hazardous atmosphere.	15	25
4.	Fire and explosion:- Introduction of fire and explosion, elements and classification of fire, and important aspects of fire and explosion.	15	25
	Total	60	100

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1.	Case Study Analysis: Examine real-world plant layouts. Identify potential hazards, unsafe workflow areas, and propose improvements.. Students will make a report and upload it on the GMIU Web portal.	10
2.	Inspection Checklist Drill: Students develop and use a checklist to identify hazards in a lab or plant simulation. Compare results with peers and discuss safety improvements. Students will upload the details on the GMIU Web portal.	10
3.	Tool Identification & Risk Assessment: Faculty will provide samples or pictures of tools to students. Students will classify them (machine, hand, power) and identify safety hazards for each. Students will upload the details on the GMIU Web portal.	10
4.	Fire Classification Drill:	10

	Faculty will provide images or items representing Class A-D fires to students. Students classify and choose the appropriate extinguisher. Students will upload it on GMIU Web portal.	
5.	Mini Site Planning: Faculty will provide a mock plant scenario (type, production, hazards). Students will draw plot layout including buildings, equipment, control rooms, storage, and pipework. Students must prepare the flowchart drawing and submit it on the GMIU Web portal.	10
Total		50

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	35%	35%	30%	00	00	00

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.

Course Outcome:

After learning the course the students should be able to:	
CO1	Explain the principles of plant siting, plant layout, site layout, plot layout, and equipment layout.
CO2	Classify machine tools, hand tools, and power tools. Identify hazards associated with different types of tools and machinery.
CO3	Identify hazards related to flammable gases and electrical systems. Identify factors affecting electrical safety systems in industries.
CO4	Apply principles of fire and explosion. Identify and classify different types of fire (Class A, B, C, D).



Instructional Method:

The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods by black board, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

Reference Books:

- [1] A Text Book of Environmental Pollution and Control. By Dr. H. S. Bhatt.
- [2] Environmental pollution analysis by S. M. Khopkar.
- [3] General oceanography: An introduction by G. Dietrich.
- [4] Fundamental concept of Environmental chemistry by G. S. Sodhi,
- [5] Plant design, economics for chemical engineering by Pater & Timmer

