INSTITUTE	**FACULTY OF TECHNOLOGY**
PROGRAM	**MASTER OF TECHNOLOGY in CHEMICAL ENGINEERING**
SEMESTER	**2**
COURSE TITLE	**SAFETY IN CHEMICAL INDUSTRIES**
COURSE CODE	**01CM0220**
COURSE CREDITS	**3**

Objective:

1 The course should be taught and curriculum should be implemented with the aim to develop required skills so that students are able to handle chemicals and operate chemical plant safely.

Course Outcomes: After completion of this course, student will be able to:

1 Explain Indian and International Safety standards.

2 Importance of safety in industry, Classify the hazards,Identify the causes of accident and explain various engineering control methods

3 Explain storage, handling and transportation of hazardous materials.

4 Classify fire extinguishing agents and methods

Pre-requisite of course: Basic knowledge of safety components.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Importance of safety in Industry** Importance of Industrial Safety .	8
2	**Classification of the Hazards** Types of hazard, Chemical hazard, Thermal hazard , Electrical hazard, Mechanical hazard, Vibrational hazard , Biological hazard, Radioactive hazard	10
3	**Safety aspects in plant layout** Safety aspects in plant layout, Ventilation and lighting.	8
4	**Different colour codes for chemical plants** Color codes and symbols for safety in chemical plants, Classification of Color codes and symbols , Color codes for gas cylinders, Color codes for pipelines	10
Total Hours		**36**

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Textbook :

1 Chemical process safety: fundamentals with applications. , Crowl, D. A., & Louvar, J. F. , Pearson Education., 2001

References:

1 Safety in the process industries., Safety in the process industries., King, R. , Elsevier., 2013

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	20.00	30.00	30.00	10.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board, may also use any of tools such as collaborative learning, demonstration, roleplay, Quiz, brainstorming, MOOCs, Active Learning Assignments etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

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

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

Supplementary Resources:

1 https://archive.nptel.ac.in/courses/103/106/103106071/

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