

Ref No:



COURSE PLAN

Academic Year 2019 – 20

Program:	B E – MECHANICAL
Semester :	VI
Course Code:	17ME662
Course Title:	INDUSTRIAL SAFETY
Credit / L-T-P:	3 / 3-0-0
Total Contact Hours:	40
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Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

A. COURSE INFORMATION

1. Course Overview

Degree:	BE	Program:	ME
Year / Semester :	III year / VI sem	Academic Year:	2019-20
Course Title:	Industrial safety	Course Code:	17ME662
Credit / L-T-P:	03/3-0-0	SEE Duration:	3 Hours
Total Contact Hours:	40	SEE Marks:	80 Marks
CIA Marks:	40 Marks	Assignment	1 / Module
Course Plan Author:	Paramesha M	Sign	Dt:
Checked By:	Shankaregowda K C	Sign	Dt:

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	INTRODUCTION TO SAFETY : Terms used: accident, safety, hazard, safe, safety devices, safety guard, security, precaution, caution, appliance, slip, trip, fall. Ladders and scaffolding. Unsafe acts, reason for accidents, MSDS (material safety data sheet), OSHA, WHO. Lockout and tag out procedures. Safe material handling and storage.	8	- Safety Devices	L2
2	FIRE SAFETY: Introduction, Class A, B, C, D and E fire. Fire triangle, Fire extinguishers, Fire hazard and analysis, prevention of fire. Fire protection and loss prevention, steps after occurrence of fire. Portable fire extinguishers. Fire detection, fire alarm and fire fighting systems. Safety sign boards, instruction on portable fire extinguishers.	8	-Fire safety	L2
3	MECHANICAL SAFETY: PPE, safety guards, Safety while working with machine tools like lathe, drill press, power and band saws, grinding machines. Safety during welding, forging and pressing. Safety while handling Material, compressed gas cylinders, corrosive substance, waste drum and containers	8	-Machine safety	L2
4	ELECTRICAL SAFETY: Introduction to electrical safety, Electric hazards, effect of electric current on human body, causes of electrical accidents, prevention of electric accidents, PPE used .Electric shock. Primary and secondary electric shocks, AC and DC current shocks.Safety precautions against shocks. Safety precautions in small and residential building intallations. Safety procedures in electric plant.	8	Electrical safety	L2
5	CHEMICAL SAFETY AND OTHER SAFETY CHECKS: Introduction to Chemical safety, Labeling of chemicals, acid hoods. Handling of acids, eye washers and showers. Safety thinking, accident investigation, safety policy of the company, safety, loss prevention and control, check list for LPG installations, safety precautions	8	- Chemical safety	L2

using CNG, fire prevention and safety audit, confined space entry, risk assessment.			
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3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Module	Details	Chapters in Books	Available
A Text books (Title, Authors, Edition, Publisher, Year.)			
1,2	Industrial Safety and Management by L M Deshmukh by McGraw Hill Education (India) private Limited,	1,2,4	In Lib
4,5	Electrical Safety, fire safety and safety management by S.Rao, R K Jain and Saluja. Khanna Publishers	2,4	In Lib
B Reference books (Title, Authors, Edition, Publisher, Year.)			
1,2	Chemical process Industrial safety by K S N Raju by McGraw Hill Education (India) private Limited	5	In Lib
4,5	Industrial Safety and Management by L M Deshmukh. McGraw Hill Education (India) private Limited,	1,2,3	In Lib
C Concept Videos or Simulation for Understanding			
C1	Safety and operation in different area https://www.youtube.com/watch?v=ePZheUvsH0w-5_min		
C2	Fire safety precaution https://www.youtube.com/watch?v=HgDfCFkBAxM-10_min		
C3	Electrical safety precaution https://www.youtube.com/watch?v=CnKeVs-9zs-15_min		
C4	Mechanical safety precaution https://www.youtube.com/watch?v=A0-vPJ0ad-44-10_min		
C5	chemical safety precaution https://www.youtube.com/watch?v=w2m5eU8XDVI-5_min		
D Software Tools for Design			

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

Students must have learnt the following Courses / Topics with described Content . . .

SNo	Course Code	Course Name	Module / Topic / Description	Sem	Remarks	Blooms Level
1	15EME15	Elements of mechanical engineering	Basic knowledge of machine parts	1	-	L2
2	15ME35B	Machine tool operation	Knowledge about the machining operation	4	-	L2

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level
1	Safety and precaution	Higher Study	Gap A seminar on General safety precaution model	Understand L2

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

#	Cos students should be able to...	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
17ME662	Understand The basic knowledge about safety devices	08	Safe precautions	Lecture/Tutorial	Assignment	L2 Understand
17ME662	Understand the fire safety and hazards	08	Fire safety	Lecture/Tutorial	Assignment	L2 Understand
17ME662	Understand the safety guards used in material shop floor	08	Machine safety	Lecture/Tutorial	Assignment	L2 Understand
17ME662	Understand the electrical safety and Hazards	08	Electrical safety	Lecture/Tutorial	Assignment	L2 Understand
17ME662	Understand the chemical safety and handling of acids & safety policy	08	-Chemical safety	Lecture/Tutorial	Assignment	L2 Understand

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

Write 1 or 2 applications per CO.

Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	Agriculture and Natural Resources Based Industries, Farming Systems, Chemical Industry, manufacturing industry, Textile industry, transport industry, Aerospace Manufacture and Maintenance	CO1	L2
2	Tribal organizations/institutions, academic institutions, hospitals.	CO2	L2
3	Mechanical Safety Equipment is a manufacturer of fall protection and confined space rescue equipment for general construction, steel erection, aircraft maintenance, and military applications among others	CO3	L2
4	Safety precautions in small and residential building, electrical labs, machine shops, electronics and computer laboratories, The purpose is to identify electrical safety hazards and present ways to minimize or avoid their consequences.	CO4	L2
5	The hazards associated with the chemicals vary depending on their properties and mode of handling and usage.	CO5	L2

4. Mapping Justification

Mapping		Justification	Mapping Level
CO	PO	-	-
CO1	PO1	Knowledge of engineering science is required to understand the safety precaution.	L2
CO1	PO2	Identify the hazards around the work environment and industries.	L2
CO1	PO12	the broadest context of technological way it is simple to engage in independent and life long learning	L2
CO2	PO1	Knowledge of engineering science to understand the fire safety management.	L2
CO2	PO2	To Identify the fire hazards and prevention of fire.	L2
CO2	PO12	Recognize the need for technology changes of fire safety	L2
CO3	PO1	Knowledge of basic concepts of engineering fundamentals is required to know the mechanical safety management.	L2
CO3	PO2	engineering science is required to Identify the operation of machining process.	L2
CO3	PO12	the broadest context of technological way it is simple to engage in independent and life long learning of machining handling system	L2
CO4	PO1	Knowledge is required to understand the electrical safety management.	L2
CO4	PO2	to identify the electrical safety hazards and precaution.	L2
CO4	PO12	the broadest context of technological way it is simple to engage in independent and life long learning of electrical safety	L2
CO5	PO1	Understand the basic Knowledge is required chemical safety and handling of acid	L2
CO5	PO2	to Identify the chemical safety and investigation.	L2
CO5	PO12	Recognize the need for technology changes of chemical safety system	L2

Note: Write justification for each CO-PO mapping.

4. Articulation Matrix

(CO - PO MAPPING)

Modules	#	Course Outcomes COs	Program Outcomes															Lev el
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2	PS O3	
1	17ME662	understand the basic knowledge about safety devices	√	√	-	-	-	-	-	-	-	-	-	√	-	-	-	L2
2	17ME662	understand the fire safety and hazards	√	√	-	-	-	-	-	-	-	-	-	√	-	-	-	L2
3	17ME662	understand the safety about machines	√	√	-	-	-	-	-	-	-	-	-	√	-	-	-	L2
4	17ME662	understand the electrical safety and Hazards	√	√	-	-	-	-	-	-	-	-	-	√	-	-	-	L2
5	17ME662	understand the chemical safety and handling of acids	√	√	-	-	-	-	-	-	-	-	-	√	-	-	-	L2
-		Average attainment (1, 2, or 3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-	PO, PSO	1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design
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5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	General safety precaution & handling system	Seminar	2 nd week / date	Dr XYZ, Inst	List from B4 above
2					
3					

Note: Write Gap topics from A.4 and add others also.

6. Content Beyond Syllabus

Mod ules	Gap Topic	Area	Actions Planned	Schedule Planned	Resources Person	PO Mapping
3	Safety devices	Placement, GATE, Higher Study	Seminar	3 rd week / date	Dr ABC, Inst. Self	List from B4 above

Note: Anything not covered above is included here.

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Mod ule #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Introduction of safety	8	2	-	-	1	1	2	CO1	L2
2	Fire safety	8	2	-	-	1	1	2	CO2	L2
3	Mechanical safety	8	-	2	-	1	1	2	CO3	L2
4	Electrical safety	8	-	2	-	1	1	2	CO4	L2
5	Chemical safety	8	-	-	4	1	1	2	CO5	L2
-	Total	40	4	4	4	5	5	10	-	-

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2,	L2
CIA Exam – 2	30	,CO3, CO4	L2
CIA Exam – 3	30	C05	L2
Assignment - 1	10	CO1, CO2	L2
Assignment - 2	10	CO3,CO4	L2

Assignment - 3	10	C05	L2
Seminar - 1	-	-	-
Seminar - 2	-	-	-
Seminar - 3	-	-	-
Other Activities define – Slip test			
Final CIA Marks	40	-	-

D1. TEACHING PLAN - 1

Module - 1

Title:	Introduction to safety	Appr Time:	8 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	
1	understand the basic safety terms	CO1	L1
b	Course Schedule	-	-
Class No	Module Content Covered	CO	Level
1	Introduction of safety& Terms used: accident, safety, hazard, safe, safety devices	CO1	L1
2	safety guard, security, precaution, caution, appliance, slip, trip, fall.	CO1	L2
3	Ladders and scaffolding. Unsafe acts, reason for accidents,	CO1	L2
4	MSDS (material safety data sheet), OSHA, WHO. Lockout and tag out procedures	CO2	L2
5	Safe material handling and storage.	CO2	L2
6	Case studies: Student should identify the unsafe acts near their surroundings like housekeeping	CO2	L2
7	lab layouts, road safety	CO2	L2
8	campus layout, safety signs	CO2	L2
c	Application Areas	CO	Level
1	Agriculture and Natural Resources Based Industries, Farming Systems, Chemical Industry, manufacturing industry, Textile industry, transport industry, Aerospace Manufacture and Maintenance	CO1	L2
2	housekeeping, lab layouts, road safety, campus layout, safety signs	CO2	L2
d	Review Questions	-	-
1	What is accident and causes of accident?	CO1	L2
2	What are the types of accident?	CO1	L2
3	What are the examples of accidents?	CO1	L2
4	Enumerate common causes of industrial accidents	CO1	L2
5	Describe various measures to prevent accidents	CO1	L2
6	What is the important of safety? Suggest different way to minimize the accidents	CO1	L2
7	Explain how the employer and employees both are affected by the accidents	CO1	L2
8	What are common injuries?	CO1	L2
9	What is hazard in safety?	CO1	L2

10	What is unsafe act and unsafe condition in safety?	CO1	L2
11	What is the best way to control hazards in the workplace?	CO1	L2
12	What's the difference between a Type I and Type II safety can?	CO1	L2
13	What is OSHA and why was it created?	CO1	L2
14	What is the main responsibility of OSHA?	CO1	L2
e	Experiences	-	-
1			
2			

Module – 2

Title:	Fire Safety	Appr Time:	08 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	understand the fire hazards and prevention of fire		L2
b	Course Schedule	-	-
Class No	Module Content Covered	CO	Level
1	Introduction, Class A, B, C, D and E fire.	CO2	L2
2	Fire triangle, Fire extinguishers, Fire hazard and analysis,	CO2	L2
3	prevention of fire. Fire protection and loss prevention,	CO2	L2
4	steps after occurrence of fire	CO2	L2
5	Portable fire extinguishers.	CO2	L2
6	Fire detection, fire alarm and fire fighting systems.	CO2	L2
7	Safety sign boards	CO2	L2
8	instruction on portable fire extinguishers.	CO2	L2
c	Application Areas	CO	Level
1	Tribal organizations/institutions, academic institutions, hospitals.	CO2	L2
d	Review Questions	-	-
1	What is Fire extinguishers? Types of Fire extinguishers.	CO3	L2
2	Explain Fire triangle concept.	CO2	L2
3	What are the causes of fires.	CO2	L2
4	Briefly explain extinguishing fire technique.	CO2	L2
5	What are the fire prevention measures?	CO2	L2
6	Explain the Fire Prevention Plan.	CO2	L2
7	Explain the guidelines for fire fire safety education and training	CO2	L2
8	Explain the prevention of fire.	CO2	L2
9	Discus the Fire protection and loss prevention.	CO2	L2
10	Briefly explain Portable fire extinguishers.	CO2	L2
11	Discuss the fire alarm and fire fighting systems.	CO2	L2
12	Explain the concept on Safety sign boards.	CO2	L2
13	What are the instruction on portable fire extinguishers.	CO2	L2
14	What is the proper height to mount a fire extinguisher, as stated in NFPA 10 guidelines?	CO2	L2
15	How do you use a portable fire extinguisher, and what is the well-known training acronym for proper extinguisher use.	CO2	L2
e	Experiences	-	-
1			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	17ME662	Sem:	VI	Marks:	30	Time:	75 minutes	
Course:	INDUSTRIAL SAFETY							
-	-	Note: Answer any 3 questions, each carry equal marks.				Marks	CO	Level
1	a	What is accident and causes of accident?				4	CO1	L2
	b	What is the important of safety? Suggest different way to minimize the accidents				5	CO1	L2
	c	What are the different safety devices used generally explain their uses				6	CO1	L2
		OR						
2	a	Explain the following I) appliance ii) slip iii) trip iv) fall				5	CO1	L2
	b	Explain briefly about lockout & tag out procedure				5	CO1	L2
	C	Explain OSHA & WHO				5	CO1	
3	a	What is meaning of fire safety brief about general term in fire safety				8	CO2	L2
	b	What is the meaning of fire protection explain with brief				7	CO2	L2
4	a	Explain following I) fire detection ii) fire alarm iii) fire fighting system				8	CO2	L2
	b	What is sign board? Why we need safety sign boards				7	CO2	L2

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions								
Crs Code:	17ME662	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes	
Course:	INDUSTRIAL SAFETY							
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.								
SNo	USN	Assignment Description				Marks	CO	Level
1		What is safety related to industry or environment. Explain briefly				05	CO1	L2
2		What is an accident explain with examples				05	CO1	L2
3		What is the meaning of hazards give an example				05	CO1	L2
4		What is the meaning of term safe give an example				05	CO1	L2
5		What is the difference between safe & safety explain with an example				05	CO1	L2
6		What are the different safety devices used generally explain their uses				05	CO1	L2
7		What is safety guard. what are different safety guard used in safety precaution				05	CO1	L2
8		What is the meaning of security explain with example				05	CO1	L2
9		What is term precaution, how we can take precaution about human body				05	CO1	L2
10		What is meaning of caution how we can express caution				05	CO1	L2
11		Explain the following w.r.t safety I) appliance ii) slip iii) trip iv) fall				05	CO1	L2
12		What is the use of ladder in safety condition explain				05	CO1	L2
13		What is the mean of scaffolding explain brief				05	CO1	L2
14		Explain the main reason for accident with example				05	CO1	L2
15		What is MSDS explain in brief				05	CO1	
16		Explain OSHA & WHO				05	CO1	L2

17		Explain briefly about lockout & tag out procedure	05	CO1	L2
18		What is meaning safe material handling & storage	05	CO1	L2
19		What is meaning of fire safety brief about general term in fire safety	05	CO2	L2
20		What are different causes in fire safety	05	CO2	L2
21		How we can classify the different causes	05	CO2	L2
22		What is meaning of ABCDE fire causes explain in brief	05	CO2	L2
23		Explain the following i) fire triangle ii) fire extinguishers iii) fire hazard iv) fire prevention	05	CO2	L2
24		What is the meaning of fire protection explain with brief	05	CO2	L2
25		What are the step involved after occurs of fire	05	CO2	L2
26		What is portable fire extinguishers explain it term	05	CO2	L2
27		Explain following i) fire detection ii) fire alarm iii) fire fighting system	05	CO2	L2
28		What is sign board? Why we need safety sign boards	05	CO2	L2
29		What are the general instruction on portable fire extinguishers	05	CO2	L2

D2. TEACHING PLAN - 2

Module – 3

Title:	Mechanical Safety	Appr Time:	08 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	understand the safety while working with machine tool like lathe, drill press, grinding machine, forging and pressing	CO5	L2
b	Course Schedule		
Class No	Module Content Covered	CO	Level
1	Introduction of mechanical safety PPE, safety guards,	CO3	L2
2	forging and pressing.	CO3	L2
3	Safety while working with machine tools like lathe,, grinding machines. Safety during welding,	CO3	L2
4	drill press, power and band saws	CO3	L2
5	Safety while handling Material,	CO3	L2
6	compressed gas cylinders,	CO3	L2
7	corrosive substance,	CO3	L2
8	waste drum and containers.	CO3	L2
c	Application Areas	CO	Level
1	Mechanical Safety Equipment is a manufacturer of fall protection and confined space rescue equipment for general construction, steel erection, aircraft maintenance, and military applications among others	CO3	L2
d	Review Questions	-	-
1	Explain the safety precaution in mechanical shop	CO3	L2
2	What PPE explain in brief	CO3	L2
3	Why we need safety guard explain	CO3	L2
4	Explain following with respect to working safety i) lathe ii) drill press iii)	CO3	L2

	power & iv) band saws		
5	What is safety precaution while working with grinding machine	CO3	L2
6	What are the safety terms for forging & pressing process	CO3	L2
7	What are safety condition while working with handling materials	CO3	L2
8	What are safety term while working with compressed gas cylinder	CO3	L2
9	Why we need safety to work with corrosive substance ? Explain in brief	CO3	L2
10	What are safety precaution for waste drum container explain brief	CO3	L2
11	What are safety precaution for machine shop explain	CO3	L2
12	What are the safety precaution taken in workshop	CO3	L2
13	Explain in safety precaution working during welding process	CO3	L2
14	Why we need safety in foundry lab	CO3	L2
15	What is necessity of safety in local industry explain in brief	CO3	L2
16	What are safety precaution taken during heat treatment process	CO3	L2
17	What are practical observation relate to safety in the mechanical industry or production industry explain with different comments	CO3	L2
18	List and explain different mechanical safety devices	CO3	L2
19	What are the machine safety precaution during working	CO3	L2
20	What are the general instructions should be carried out an production plant	CO3	L2
e	Experiences	-	-
1			

Module – 4

Title:	Electrical Safety	Appr Time:	08 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	understand the electrical safety	CO4	L2
b	Course Schedule		
Class No	Module Content Covered	CO	Level
1	Introduction to electrical safety, Electric hazards	CO4	L2
2	effect of electric current on human body,	CO4	L2
3	causes of electrical accidents	CO4	L2
4	prevention of electric accidents, PPE used	CO4	L2
5	Primary and secondary electric shocks, AC and DC current shocks.	CO4	L2
6	Safety precautions against shocks	CO4	L2
7	Safety precautions in small and residential building installations	CO4	L2
8	Safety procedures in electric plant	CO4	L2
c	Application Areas	CO	Level
1	Safety precautions in small and residential building, electrical labs, machine shops, electronics and computer laboratories, The purpose is to identify electrical safety hazards and present ways to minimize or avoid their consequences.	CO4	L2
d	Review Questions	-	-
1	Explain the different safety precaution of electrical industry	CO4	L2
2	Explain brief about electric safety	CO4	L2

3	What is the meaning of electric hazards explain brief	CO4	L2
4	What are the electrical safety precaution	CO4	L2
5	Why is electrical safety important	CO4	L2
6	What are the effect of electric current on human boundary explain brief	CO4	L2
7	What are causes of electrical accidents explain brief	CO4	L2
8	What are prevention of electrical accident	CO4	L2
9	What is use of PPE relate to electrical safety	CO4	L2
10	What is electric shock explain with example	CO4	L2
11	What is meaning of primary and secondary electric shocks	CO4	L2
12	What are different between primary and secondary electric shocks	CO4	L2
13	What is AC current shock with example	CO4	L2
14	What is DC current shock with example	CO4	L2
15	What are safety precaution against the shocks	CO4	L2
16	Explain the safety precaution in small building installations explain brief	CO4	L2
17	Explain the safety precaution in residential building installations explain brief	CO4	L2
18	What are comparison between small building & residential building installations	CO4	L2
19	What are safety procedure in electric plant explain brief	CO4	L2
e	Experiences	-	-
1			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	17ME662	Sem:	VI	Marks:	30	Time:	75 minutes	
Course:	INDUSTRIAL SAFETY							
-	-	Note: Answer any 2 questions, each carry equal marks.				Marks	CO	Level
1	a	Explain the safety precaution in mechanical shop				5	CO4	L2
	b	What PPE explain in brief				5	CO4	L2
	c	Why we need safety guard explain				5	CO4	L2
		OR						
2	a	Explain following with respect to working safety i) lathe ii) drill press iii) power & iv) band saws				7	CO4	L2
	b	Why we need safety to work with corrosive substance ? Explain in brief				8	CO4	L2
		OR						
3	a	What is the meaning of electric hazards explain brief				5	CO4	L2
	b	What are the electrical safety precaution				5	CO4	L2
	c	What is AC current shock with example				5	CO4	L2
		OR						
4	a	Explain the safety precaution in small building installations explain brief				8	CO4	L2
	b	What are different between primary and secondary electric shocks				7	CO4	L2

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	17ME662	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	INDUSTRIAL SAFETY						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		Explain the safety precaution in mechanical shop	05	CO4	L2
2		What PPE explain in brief	05	CO4	L2
3		Why we need safety guard explain	05	CO4	L2
4		Explain following with respect to working safety I) lathe ii) drill press iii) power & iv) band saws	05	CO4	L2
5		What is safety precaution while working with grinding machine	05	CO4	L2
6		What are the safety terms for forging & pressing process	05	CO4	L2
7		What are safety condition while working with handling materials	05	CO4	L2
8		What are safety term while working with compressed gas cylinder	05	CO4	L2
9		Why we need safety to work with corrosive substance ? Explain in brief	05	CO4	L2
10		What are safety precaution for waste drum container explain in brief	05	CO4	L2
11		What are the electrical safety precaution	05	CO4	L2
12		Why is electrical safety important	05	CO4	L2
13		What are the effect of electric current on human boundary explain in brief	05	CO4	L2
14		What are causes of electrical accidents explain in brief	05	CO4	L2
15		What are prevention of electrical accident	05	CO4	L2
16		What is use of PPE relate to electrical safety	05	CO4	L2
17		What is electric shock explain with example	05	CO4	L2
18		What is meaning of primary and secondary electric shocks.	05	CO4	L2
19		What are different between primary and secondary electric shocks.	05	CO4	L2
20		What is AC current shock with example.	05	CO4	L2
21		What is DC current shock with example.	05	CO4	L2
22		What are safety precaution against the shocks	05	CO4	L2
23		Explain the safety precaution in small building installations explain in brief.	05	CO4	L2
24		Explain the safety precaution in residential building installations explain in brief	05	CO4	L2
25		What are comparison between small building & residential building installations.	05	CO4	L2
26		What are safety procedure in electric plant explain in brief.	05	CO4	L2

D3. TEACHING PLAN - 3

Module – 5

Title:	Chemical Safety and other checks	Appr Time:	08 Hrs
a	Course Outcomes	-	Blooms
-	students will be able to	-	Level
1	understand the chemical safety and handling of acids	CO5	L2
b	Course Schedule		
Class No	Module Content Covered	CO	Level
1	Introduction to Chemical safety	CO5	L2
2	Labeling of chemicals, acid hoods. Handling of acids	CO5	L2
3	eye washers and showers. Safety thinking, accident investigation	CO5	L2
4	safety policy of the company, safety, loss prevention and control	CO5	L2

5	check list for LPG installations	CO5	L2
6	safety precautions using CNG	CO5	L2
7	fire prevention and safety audit	CO5	L2
8	confined space entry, risk assessment.	CO5	L2
c	Application Areas	CO	Level
1	The hazards associated with the chemicals vary depending on their properties and mode of handling and usage	CO5	L2
d	Review Questions	-	-
1	List of different chemical industry	CO5	L2
2	Explain safety precaution in chemical industry	CO5	L2
3	List out the different chemical used in chemical industry	CO5	L2
4	Explain the different acid hoods in chemical industry	CO5	L2
5	What are different method of handling of acid	CO5	L2
6	Explain eye washes & showers	CO5	L2
7	Explain brief about accident investigation in chemical industry	CO5	L2
8	Explain safety policy of the company	CO5	L2
9	Explain safety policy of the loss prevention in company	CO5	L2
10	What are controlling factor in the safety policy of the company	CO5	L2
11	Explain the check list for LPG installation	CO5	L2
12	Explain safety precaution using CNG	CO5	L2
13	What is CNG explain disadvantage of CNG	CO5	L2
14	Explain the term of fire prevention in brief	CO5	L2
15	What is the meaning of safety audit explain	CO5	L2
16	What is risk assessment explain	CO5	L2
17	What is confined space entry explain in brief	CO5	L2
e	Experiences	-	-
1			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	17ME662	Sem:	VI	Marks:	30	Time:	75 minutes	
Course:	INDUSTRIAL SAFETY							
-	-	Note: Answer any 2 questions, each carry equal marks.				Marks	CO	Level
1	a	List of different chemical industry.				20	CO5	L2
	b	Explain safety precaution in chemical industry.				10	CO5	L2
		OR						
2	a	Explain safety precaution using CNG.				20	CO5	L2
	b	What is CNG explain disadvantage of CNG.				10	CO5	L2
		OR						
3	a	List out the different chemical used in chemical industry.				20	CO5	L2
	b	Explain the different acid hoods in chemical industry.				10	CO5	L2
		OR						
4	a	What are different method of handling of acid.				20	CO5	L2
	b	Explain eye washes & showers.				10	CO5	L2

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	15ME662	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	INDUSTRIAL SAFETY						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							
SNo	USN	Assignment Description			Marks	CO	Level
1		List of different chemical industry			05	CO5	L2
2		Explain safety precaution in chemical industry			05	CO5	L2
3		List out the different chemical used in chemical industry			05	CO5	L2
4		Explain the different acid hoods in chemical industry			05	CO5	L2
5		What are different method of handling of acid			05	CO5	L2
6		Explain eye washes & showers			05	CO5	L2
7		Explain brief about accident investigation in chemical industry			05	CO5	L2
8		Explain safety policy of the company			05	CO5	L2
9		Explain safety policy of the loss prevention in company			05	CO5	L2
10		What are controlling factor in the safety policy of the company			05	CO5	L2
11		Explain the check list for LPG installation			05	CO5	L2
12		Explain safety precaution using CNG			05	CO5	L2
13		What is CNG explain disadvantage of CNG			05	CO5	L2
14		Explain the term of fire prevention in brief			05	CO5	L2

F. EXAM PREPARATION

1. University Model Question Paper

Course:	INDUSTRIAL SAFETY				Month / Year	May /2020		
Crs Code:	17ME662	Sem:	VI	Marks:	100	Time:	180 minutes	
-	Note	Answer all FIVE full questions. All questions carry equal marks.				Marks	CO	Level
1	a	What is accident and causes of accident?				5	CO1	L2
	b	What is the important of safety? Suggest different way to minimize the accidents				6	CO1	L2
	c	What are the different safety devices used generally explain their uses				8	CO1	L2
		OR						L2
-	a	What is meaning of fire safety brief about general term in fire safety				8	CO2	L2
	b	What is the meaning of fire protection explain with brief				6	CO2	L2
	c	Explain following i) fire detection ii) fire alarm iii) fire fighting system				8	CO2	L2
		What is sign board? Why we need safety sign boards				6	CO2	L2
2	a	Explain the safety precaution in mechanical shop				6	CO3	L2
	b	What PPE explain in brief				5	CO3	L2
	c	Why we need safety guard explain				5	CO3	L2
	d	Explain following with respect to working safety i) lathe ii) drill press iii) power & iv) band saws				8	CO3	L2
		OR						L2
-	a	Why we need safety to work with corrosive substance ? Explain in brief				8	CO4	L2
	b	What is the meaning of electric hazards explain brief				7	CO5	L2
	c	What are the electrical safety precaution				6	CO5	L2
								L2
3	a	Explain the safety precaution in small building installations explain brief				7	CO5	L2
	b	What are different between primary and secondary electric shocks				6	CO5	L2
	c	What are the effect of electric current on human boundary explain brief				5	CO5	L2

	d	What are causes of electrical accidents explain brief	5	CO5	L2
		OR			
-	a	Explain the safety precaution in mechanical shop	6	CO4	L2
	b	What PPE explain in brief	5	CO4	L2
	c	Why we need safety guard explain	5	CO4	L2
					L2
4	a	List of different chemical industry	6	CO5	L2
	b	Explain safety precaution in chemical industry	6	CO5	L2
	c	Explain safety precaution using CNG	6	CO5	L2
		OR			
-	a	List out the different chemical used in chemical industry	7	CO5	L2
	b	Explain the different acid hoods in chemical industry	7	CO5	L2
	c	What are different method of handling of acid	6	CO5	L2
					L2
5	a	Explain eye washes & showers	6	CO5	L2
	b	What is CNG explain disadvantage of CNG	6	CO5	L2
	c	Explain following with respect to working safety I) lathe ii) drill press iii) power & iv) band saws	7	CO5	L2
	a	What is AC current shock with example	6	CO5	L2
	b	What are controlling factor in the safety policy of the company	7	CO5	L2
	c	Explain the term of fire prevention in brief	6	CO5	L2

2. SEE Important Questions

Course:	INDUSTRIALSAFETY				Month / Year	May /2020		
Crs Code:	15ME662	Sem:	VI	Marks:	100	Time:	180 minutes	
	Note	Answer all FIVE full questions. All questions carry equal marks.				-	-	
Mod ule	Qno.	Important Question				Marks	CO	Year
1	1	Explain the different safety precaution of electrical industry				6	CO1	
	2	Explain brief about electric safety				7	CO1	
	3	What is the meaning of electric hazards explain brief				5	CO2	
	4	What are the electrical safety precaution				6	CO2	
2	1	What is Fire extinguishers? Types of Fire extinguishers				6	CO2	
	2	Explain Fire triangle concept				6	CO2	
	3	What are the causes of fires?				5	CO2	
	4	Briefly explain extinguishing fire technique.				6	CO2	
	5	What are the fire prevention measures?				6	CO2	
3	1	Explain the safety precaution in mechanical shop.				6	CO3	
	2	What PPE explain in brief?				6	CO3	
	3	Why we need safety guard explain				6	CO3	
	4	Explain following with respect to working safety I) lathe ii) drill press iii) power & iv) band saws				8	CO3	
	5	What is safety precaution while working wiyh grinding machine				6	CO3	
4	1	Explain the different safety precaution of electrical industry				6	CO4	
	2	Explain brief about electric safety				6	CO4	
	3	What is the meaning of electric hazards explain brief				6	CO4	
	4	What are the electrical safety precaution				6	CO4	
	5	Why is electrical safety important				6	CO4	

5	1	Explain brief about accident investigation in chemical industry	7	CO5	
	2	Explain safety policy of the company	6	CO5	
	3	Explain safety policy of the loss prevention in company	6	CO5	
	4	What are controlling factor in the safety policy of the company	6	CO5	
	5	Explain the check list for LPG installation	6	CO5	

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Blooms' Level	Identified Action Verbs for Learning	Instruction Methods for Learning	Assessment Methods to Measure Learning
A	B	C	D	E	F	G	H
1	INTRODUCTION TO SAFETY : Terms used: accident, safety, hazard, safe, safety devices, safety guard, security, precaution, caution, appliance, slip, trip, fall. Ladders and scaffolding. Unsafe acts, reason for accidents, MSDS (material safety data sheet), OSHA, WHO. Lockout and tag out procedures. Safe material handling and storage.	8	- L1 - L2	L2	Understand	- Lecture	- Assignment -CIE -Unit Test
2	Introduction, Class A, B, C, D and E fire. Fire triangle, Fire extinguishers, Fire hazard and analysis, prevention of fire. Fire protection and loss prevention, steps after occurrence of fire. Portable fire extinguishers. Fire detection, fire alarm and fire fighting systems. Safety sign boards, instruction on portable fire extinguishers.	8	- L1 - L2	L2	Understand	- Lecture	- Assignment -CIE -Unit Test
3	PPE, safety guards, Safety while working with machine tools like lathe, drill press, power and band saws, grinding machines. Safety during welding, forging and pressing. Safety while handling Material, compressed gas cylinders, corrosive substance, waste drum and containers	8	- L1 - L2	L2	Understand	- Lecture	- Assignment -CIE -Unit Test
4	Introduction to electrical safety, Electric hazards, effect of electric current on human body, causes of electrical accidents, prevention of electric accidents, PPE used .Electric shock. Primary and secondary electric shocks, AC and DC current shocks.Safety precautions against shocks. Safety precautions in small and residential building intallations. Safety procedures in electric plant.	8	- L1 - L2	L2	Understand	- Lecture	- Assignment -CIE -Unit Test
5	Introduction to Chemical safety, Labeling of	8	- L1	L2	Understand	- Lecture	-Assignment

chemicals, acid hoods. Handling of acids, eye washers and showers. Safety thinking, accident investigation, safety policy of the company, safety, loss prevention and control, check list for LPG installations, safety precautions using CNG, fire prevention and safety audit, confined space entry, risk assessment.		- L2		nd		-CIE -Unit Test
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2. Concepts and Outcomes:

Table 2: Concept to Outcome – Example Course

Module #	Learning or Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome Student Should be able to ...
A	I	J	K	L	M	N
1	Safety devices -safety guard	-accident, safety devices, -safety guard	Safety precaution	Understand the safety terms	-Understand - safety precautions - lockout and tag out procedures - Safe material handling system	understand the basic safety terms
2	-fire hazard -prevention of fire	-Fire triangle extinguishers, -Fire hazard fire.	Fire safety	Understand the fire prevention technique	-Understand - fire prevention technique -safety alarm system	Understand the fire safety and hazards
3	-Safety handling materials -safety guards	-safety guards - Safety while handling Material	Machine and material safety	Understand the safety material handling	-Understand - safety procedure in machining process - safety procedure in compressed gas cylinder, corrosive substance, waste drum and containers.	Understand the safety guards used in material shop floor
4	-electrical safety -electric hazards	-Primary and secondary electric shocks - Safety procedures	Electrical safety	Understand the electrical safety system	-Understand - Electrical safety precaution -Safety procedures in electric plant.	Understand the electrical safety and Hazards
5	-Chemical safety -handling of acids	-accident investigation, safety policy of the company	Chemical safety	Understand the chemical safety and safety handling of acids	-Understand -chemical safety system -safety policy	Understand the chemical safety and handling of acids & safety policy

