22MEHO109	FIRE ENGINEERING AND EXPLOSION CONTROL				
	CATEGORY	L	T	P	C
	PE	3	0	0	3

COURSE OBJECTIVES

1	To understand and learn the fundamentals of fire, explosion and theory of combustion.
2	To know various classes of fires & types of fire extinguishers
3	To understand and learn various fire protection systems, components and their working
4	To understand the various fire-resistant materials and to design fire pro of building
5	To understand the principles of explosion protection systems

UNIT I	FIRE AND EXPLOSIONS	9	0	0	9

Fire properties of solid, liquid and gases - fire spread - toxicity of products of combustion – theory of combustion and explosion – vapour clouds – flash fire – jet fires – pool fires -auto-ignition–boiling liquid expanding vapour explosion – Flix borough, Mexico disaster, Bombay Victoria dock ship explosions.

UNIT II	FIRE PREVENTION AND PROTECTION	9	0	0	9

Sources of ignition – fire triangle – principles of fire extinguishing – active and passive fire protection systems – various classes of fires – A, B,C,D,E - types of fire extinguishers – fire stoppers – hydrant pipes – hoses -fire alarms and sirens – foam generators – escape from fire rescue operations–fire drills–notice- first aid for burns.

UNIT III	FIRE PREVENTION AND PROTECTION	9	0	0	9

Sprinkler-hydrants-stand pipes – special fire suppression systems like deluge and emulsifier, selection criteria of the above installations, reliability, maintenance, evaluation and standards –alarm and detection systems, suppression systems – CO2 system, foam system– smoke venting-firefighting systems.

UNIT IV	BUILDING FIRE SAFETY	9	0	0	9

Objectives of fire safe building design, Fire load, fire resistant material and fire testing–structural fire protection– structural integrity–concept of egress design –with calculations- fire certificates–fire safety requirements for high rise buildings–snookers.

UNIT V	EXPLOSION PROTECTING SYSTEMS	9	0	0	9

Principles of explosion-detonation and blast waves-explosion parameters – Explosion Protection, Containment, Flame Arrestors, isolation, suppression, venting, explosion relief of large enclosure- explosion venting-inert gases, suppression system based on carbon dioxide (CO2) and halons- hazards in LPG,
Ammonia (NH3), Sulphur dioxide(SO2),chlorine(CL2).

TOTAL (45L) : 45 PERIODS

REFERENCE BOOKS:

1	Gupta,R.S.,"HandBookofFireTechnology"OrientLongman,Bombay1977.
2	"AccidentPreventionmanualforindustrialoperations"N.S.C.,Chicago,1982.
3	Dinko Tuhtar,"Fire and explosion protection".
4	"Davis Danieletal,"HandBook offire technology".
5	FirefightershazardousmaterialsreferencebookFirePreventioninFactories",anNostr and ReinHold,New York,1991.

COURSE OUTCOMES: Upon completion of this course, the students will be able to:		**Bloom Taxonomy Mapped**
CO1	Describe the fundamentals of fire, explosion and theory of combustion.	Understand
CO2	Classify the fire, class of fire and equipment for fire extinguishing.	Understand
CO3	Explain various industrial fire protection systems components and their working.	Understand
CO4	Design the building with fire protection and concepts of their design.	Create
CO5	Describe the explosion protection system for various application.	Understand

COURSE ARTICULATION MATRIX

COs/POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	0	1	0	1	0	0	0	0	0	0	2	0	0
CO2	3	2	0	0	0	1	2	0	0	0	0	0	2	0	0
CO3	3	2	0	1	2	1	2	0	0	0	0	0	2	0	0
CO4	2	1	3	2	0	1	2	0	0	0	1	0	2	0	0
CO5	3	2	0	1	2	2	1	0	0	0	1	0	2	0	0
AVG	**2.8**	**1.8**	**3**	**1.25**	**2**	**1.2**	**1.75**	**0**	**0**	**0**	**1**	**1**	**2**	**0**	**0**

3/2/1 – indicates strength of correlation (3 – high, 2- medium, 1- low)