DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**M.Tech. Industrial Safety Engineering**		
Course Title	**SAFETY MANAGEMENT**		
Course Code	**ME653**	**No. of credits**	**3**
Pre-requisites Course Code			
Session	**July 2021**	**Class & Section**	
Name of Faculty	**Dr. K. R. Balasubramanian**	**Department**	**Mechanical Engineering**
E-mail ID	**krbala@nitt.edu**	**Telephone No.**	**94435 61873 88387 35970**
Course Type	☑ **Core course** ☐ **Elective course**		

Syllabus (approved in BoS)

CONCEPTS AND TECHNIQUES
Evolution of modern safety concept, Safety as integral part of business-Safety policy- Safety Organization- line and staff functions for safety- Safety Committee-budgeting for safety. Incident Recall Technique (IRT), disaster control, Job Safety Analysis (JSA), safety survey, safety inspection, safety sampling, Safety Audit.

ACCIDENT INVESTIGATION AND REPORTING
Concept of an accident, reportable and non-reportable accidents, contribution factor for accident – principles of accident prevention, Supervisory role- Role of safety committee – Accident causation models - Cost of accident. Overall accident investigation process - Response to accidents, India reporting requirement, Planning document, Planning matrix, Investigators Kit, functions of investigator, four types of evidences, root cause analysis, Records of accidents, accident reports- Class exercise with case study.

SAFETY PERFORMANCE MONITORING
Reactive and proactive monitoring techniques - Permanent total disabilities, permanent partial disabilities, temporary total disabilities -Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate, safety “t” score, safety activity rate – problems, modern tool usage, accident data analysis.

SAFETY EDUCATION AND TRAINING

Importance of training-identification of training needs-training methods – training evaluation methods-program, seminars, conferences, competitions – method of promoting safe practice - motivation – communication - role of government agencies and private consulting agencies in safety training – creating awareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign – Domestic Safety and Training.

EFFECTIVE SAFETY MANAGEMENT SYSTEM AND ETHICS

Purpose, Safety Culture, Safety functions, Elements of process safety management, Behavior Based Safety, Elements of Safety Management System, Concept of BBIP, OSHA guidelines, Voluntary Safety and Health Program management guidelines, 1989

Introduction, basic principles, duties and obligations, conditions of execution of the functions of occupational safety professionals.

Course Objectives

The objectives of this course is to imbibe knowledge on,

- safety management functions and techniques
- accident reporting and investigation procedures
- safety education and training, evaluation of safety performance in an organisation.

Course Outcomes (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
On completing this course students will be able to, ➢ Apply principles of safety management, its functions and technique in any organization, ➢ Classify and categorize the factors contributing to accident, ➢ Formulate accident investigation program in an organization, develop and practice accident reporting system, ➢ Recognize the importance of safety education and training in an organization, ➢ Practice safety professional ethics, ➢ Identify and comply with statutory and regulatory requirement.	

Cos/Pos		Course Outcomes (Cos)					
		CO1	CO2	CO3	CO4	CO5	CO6
Programme Outcomes (Pos)	PO1	H	H	H	H	H	H
	PO2	M	M	M	M	M	M
	PO3	L	L	L	L	L	L
	PO4	L	L	L	L	L	L
	PO5	M	M	M	M	M	M
	PO6	H	H	H	H	H	H
	PO7	H	H	H	H	H	H
	PO8	M	M	M	M	M	M
	PO9	H	H	H	H	H	H
	PO10	H	H	H	H	H	H
	PO11	M	M	M	M	M	M

COURSE PLAN – PART II

Course Overview

Safety management is a comprehensive management system designed to manage safety elements in the workplace. It includes policy, objectives, plans, procedures, organisation, responsibilities and other measures. The safety management is used in industries that manage significant safety risks, including, petroleum, chemical, electricity generation and others.

An safety management provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective

Course Teaching and Learning Activities

S.No	Week	Topic	Mode of Delivery
1.	1 - 2	Evolution of modern safety concept, Safety as integral part of business-Safety policy- Safety Organization- line and staff functions for safety.	Online mode
2.	3 - 4	Safety Committee-budgeting for safety. Incident Recall Technique (IRT), disaster control.	Online mode
3.	5 - 6	Concept of an accident, reportable and non-reportable accidents, contribution factor for accident – principles of accident prevention, Supervisory role- Role of safety committee – Accident causation models - Cost of accident.	Online mode
4.	7-8	Overall accident investigation process - Response to accidents, India reporting requirement, Planning document, Planning matrix, Investigators Kit, functions of investigator, four types of evidences, root cause analysis, Records of accidents, accident reports- Class exercise with case study.	Online mode
5.	9-10	Job Safety Analysis (JSA), safety survey, safety inspection, safety sampling, Safety Audit	Online mode
6.	11-12	Reactive and proactive monitoring techniques - Permanent total disabilities, permanent partial disabilities, temporary total disabilities -Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident	Online mode

		rate, safety “t” score, safety activity rate – problems, modern tool usage, accident data analysis.	
7.	13-14	Importance of training-identification of training needs-training methods – training evaluation methods-program, seminars, conferences, competitions – method of promoting safe practice - motivation – communication - role of government agencies and private consulting agencies in safety training – creating awareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign – Domestic Safety and Training.	Online mode
8.	15-16	Purpose, Safety Culture, Safety functions, Elements of process safety management, Behavior Based Safety, Elements of Safety Management System, Concept of BBIP, OSHA guidelines, Voluntary Safety and Health Program management guidelines, 1989. Introduction, basic principles, duties and obligations, conditions of execution of the functions of occupational safety professionals.	Online mode
9.	17-18	Final Examination	

Course Assessment Methods

S.No	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assignment / Seminar Presentation	4th Week		10%
2.	Written Test – 1	6th Week	1 hour	25%
3.	Assignment / Seminar Presentation	8th Week		10%
4.	Written Test - 2	12th Week	1 hour	25%
CPA	Written Test (Portions including Written Tests 1 & 2)	14th Week	1 hour	25%
5.	Final Assessment	17th Week	3 hours	30%

Essential Readings: Textbooks, reference books, etc.

1. Accident Prevention Manual for Industrial Operations", N.S.C.Chicago, Third edition 2008.
2. Heinrich H.W. "Industrial Accident Prevention" McGraw-Hill Company, New York, Fifth Edition 2007.
3. Krishnan N.V. "Safety Management in Industry" Jaico Publishing House, Bombay, 1997.
4. John Ridley, "Safety at Work", Butterworth & Co., London, Sixth Edition ,1999.
5. Roland P. Blake , "Industrial Safety" Prentice Hall, Inc., New Jersey, Second Edition, 1997
6. "Industrial safety management", L M Deshmukh, TATA McGraw Hill, Forth edition, 2010.

Course Exit Survey (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept.
2. Feedback form issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course.
3. Student knowledge about the topic covered in this course will be judged based on the marks obtained in the written examinations.

COURSE POLICY
(preferred mode of correspondence with students, compensation assessment policy to be specified)

- Students must attend all the classes regularly.
- The Institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades.
- All assessment of a course will be done on the basis of marks.

COMPENSATION ASSESSMENT POLICY

Students who absent for Written test - I & II for genuine reasons may be permitted for writing compensation assessment. The syllabus for the compensation assessment will be for those prescribed for the written test I & II and prior approval from the faculty in-charge is mandatory for appearing compensation assessment.

ATTENDANCE POLICY

(A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**

Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

ADDITIONAL INFORMATI ON:

- Students can reach course faculty by fixing appointment through E-mail: (krbala@nitt.edu) or phone (8838735970&94435 61873)

FOR APPROVAL:

Course Faculty

15/09/2021

CC – Chairperson

16/09/2021

Head of the Department
MED

Guidelines:

a) The number of assessments for a course shall range from 4 to 6.

b) Every course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or class average/2 whichever is greater.		Peak/3 or class average/2 whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.