GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Environmental Management

Course / Subject Code : ME02018041

Course / Subject Name: Environmental Risk Management

w.e.f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisite:	Knowledge of health impact and hazards
Rationale:	Planning, executing and managing major risk with the understanding of organized risk assessment and management, multidisciplinary approach to evaluating scientific data, the techniques involved in analyzing risks.

Course Outcome:

After Completion of the Course, Student will able to:

No.	Course Outcomes
01	Describe the importance of Risk management
02	Discuss the need of risk communication, economics of risk & risk evaluation
03	Illustrate methods of the risk identification, evaluation & mitigation.
04	Examine the extent of damage performing Consequence analysis
05	Understand the Disaster Management Plan (DMP) and Emergency preparedness plan(EDP)

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial/Practical		
L	T	PR	C	ESE (E)	PA/ CA (M)	PA/CA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150

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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	**Introduction:** Environment Risk assessment and Management: Assessing risk to human health and ecological systems from chemicals. Risk assessment and management for waste treatment and disposal.	**10**	**25**
2	**Risk Communication, Economics of risk and valuing risk**	**5**	**10**
3	**Risk Assessment Process:** Conceptual frame work, Hazard identification, Hazard assessment, Risk estimation, Risk evaluation, Risk mitigation, Risk assessment in option evaluation, Risk assessment during operation of risk assessment	**10**	**25**
4	**Maximum Credible accidents (MCA) analysis:** Hazard indices viz. Dow's fire and explosion. Indexc (FEI) and MOND index – degree of hazard – toxicity index	**5**	**10**
5	**Consequence analysis:** Development and assessment of various scenarios, determination of extent of damage	**08**	**20**
6	**Disaster Management Plan (DMP) and Emergency preparedness plan (EDP)**	**5**	**10**
	Total	**42**	**100**

Suggested SpecificationTable with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	30	30	10	10	0

Where R:Remember; U:Understanding; A:Application, N:Analyze and E:Evaluate C:Create(as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Hand book of Environmental Impact Assessment vol –1: By Judith petts,
2. The Risk Assessment of Environmental and Human Health Hazards (Text book of case studies): By Paustenbach, D.ceds
3. Hand book of Env Risk Assessment and Management Edited: By Peter Callow
4. Environmental Risks and Hazards: By Cutter and Susan

(b) Open sources of software and website: US EPA, MOEF&CC, NPTEL

Suggested Course Practical List:

1. Hazard Identification of given Industry.
2. Prediction of potential chemical release using ALOHA model.
3. Case study on Risk Assessment of thermal power plant with remedial measures.
4. Case study on Risk Assessment of Chemical Industry with remedial measures.
5. Case study on Risk Assessment of landfill site with remedial measures
6. Case study on Risk Assessment of CETP/BMW with remedial measures

Suggested Activities for Students:

- Exercises based on Maximum Credible accidents (MCA) analysis, Disaster Management Plan (DMP) and Emergency preparedness plan (EDP), Hazard indices, Dow's fire and explosion index, toxicity index, fault tree analysis, HAZAN and HAZOP, DMP and Emergency preparedness Plan

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