CEDX 45	ENVIRONMENTAL RISK ASSESSMENT	L	T	P	C
SDG: 3&6		3	0	0	3

COURSE OBJECTIVES:

COB1: To impart knowledge on various types of risk and regulatory perspectives and requirement of risk management

COB2: To make them to assess, analyse and categorize the various types of risks and vulnerability.

COB3: To give knowledge on various assessing tools and methods for risk assessment.

COB4: To enable them to manage the risk under various situations and provide the preparedness plan.

COB5: To familiarise them about the various environment health risk and its assessment based on various industries.

MODULE I RISK ASSESSMENT **8**

Sources of Environmental hazards – Environmental and Ecological Risks – Environmental risk assessment framework – Regulatory perspectives and requirements – Risk analysis and management

MODULE II ELEMENTS OF ENVIRONMENTAL RISK ASSESSMENT **9**

Hazard identification – Receptor exposure to environmental contaminants - Dose Response Evaluation – Exposure Assessment – Exposure Factors, Slope factors, dose response calculations and dose conversion factors – Risk characterization – Vulnerability assessment – Uncertainty analysis.

MODULE III TOOLS AND METHODS **9**

HAZOP and FEMA methods – Cause failure analysis – Event tree and Fault tree modelling and analysis – Estimation of carcinogenic and non-carcinogenic risks to human health – Methods in ecological risk assessment – Radiation risk assessment – Data sources and evaluation.

MODULE IV RISK MANAGEMENT **9**

Risk communication and Risk perception – Comparative Risks – Risks based decision making – Risk based environmental standard setting – Risk cost benefit optimization and tradeoffs – Emergency preparedness plans- Design of Risk management programs – Risk based remediation.

MODULE V HEALTH RISK ASSESSMENT &CASE STUDIES **10**

Health risk assessment (HRA) - Characteristics of HRA - Benefits – General guide line for HRA - Linkage between environmental hazard and human health - Case studies on risk assessment and management for hazardous chemical storage, Tanneries, Textile industries, Hazardous waste disposal facilities, Nuclear power plants.

L – 45; TOTAL HOURS – 45

TEXT BOOKS:

1. Cutter, S.L., Environmental Risk and Hazards, Prentice-Hall of India Pvt. Ltd., New Delhi, 2009.
2. Dalezio, N.R, “Environmental Hazards Methodologies for Risk Assessment and Management”, IWA Publishing, UK, 2017.
3. Gruiz, K., Meggyes, T., Fenyvesi, E., “Engineering Tools for Environmental Risk Management”, Taylor and Francis, 2014.
4. Kasperson,J.K., Kasperson,R.E., “Global Environmental Risks”, V.N.University Press, New York, 2003.

REFERENCES:

1. Joseph F Louvar and B Diane Louver “Health and Environmental Risk Analysis fundamentals with applications”, Prentice Hall, New Jersey 2011.
2. Kofi Asante Duah Risk Assessment in Environmental management, John Wiley and sons, Singapore, 2013.
3. Mark G.Robson, William S.Toscono, Qingyu Meng and Debra A.Kaden, “Risk Assessment for Environmental Health”, CRC Press, 2nd Edition 2022.
4. Theodore, L., Dupont, R.R., “Environmental Health and Hazard Risk Assessment: Principles and Calculations”, CRC Press, Taylor and Francis, 2012.
5. Ted Simson, “Environmental Risk Assessment a Toxicological Approach” CRC Press, Taylor & Francis group, Second Edition, 2020.
6. Susan L.Cutter, “Environmental Risks and Hazards” Prentice Hall of India, New Delhi 2009.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1: Attain knowledge on environmental risk and its framework

CO2: Evaluate the hazard exposure level and characterize the risk based on its vulnerability.

CO3: Identify the risk by using various risk assessing tools and methods.
CO4: Manage the risk situations and provide preparedness plans
CO5: Explain the environmental health hazard and the risk assessment for various industries.

Board of Studies (BoS):
18th BoS of CE held on 05.04.2023

Academic Council:
20th Academic council held on 13.4.2023

	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	L	L	M	-	L	M	H	L	-	-	-	-	-	-	H
CO2	L	L	M	-	L	M	H	L	-	-	-	-	-	-	H
CO3	L	L	M	-	H	M	H	L	-	-	-	-	-	-	H
CO4	L	L	M	-	L	M	H	L	-	-	-	-	-	-	H
CO5	L	L	M	-	L	M	H	L	-	-	-	-	-	-	H

Note: L- Low Correlation M - Medium Correlation H -High Correlation

SDG 3 : Ensure healthy lives and promote well-being for all at all ages
SDG 6: Ensure availability and sustainable management of water and sanitation for all.
Statement: The knowledge about the risk assessment leads to protection of environment and health against any hazard.

CEDX 46	ENVIRONMENTAL IMPACT	L	T	P	C
SDG: 3,6, 15	ASSESSMENT	3	0	0	3

COURSE OBJECTIVES:

COB1: To impart knowledge on the importance and stages of Environmental Impact Assessment.

COB2: To give exposure to the methodologies of EIA.

COB3: To impart an understanding of the public participation, resettlement and rehabilitation processes in EIA.

COB4: To familiarize the students with the documentation of EIA and environmental management plan.

COB5: To enhance knowledge on the exposure related to the environmental audit and life cycle assessment

MODULE I BASIC CONCEPTS 9

Evolution of EIA (Environmental Impact Assessment) - Concepts - Stages of EIA -Screening - Scoping – Mitigation- Need for EIA – Environmental Impact Statement (EIS) - EIA capability and limitations-, Types of EIA - Rapid and Comprehensive EIA - Legislative and Environmental Clearance procedure in India

MODULE II EIA METHODOLOGIES 9

Methods of EIA –Check lists – Matrices – Networks – Cost-benefit analysis –Analysis of alternatives- Impact of development projects – Sustainable development-Assessment of Impact - Air - Water - Soil – Noise and Biological environment.

MODULE III PUBLIC PARTICIPATION 9

Socio-cultural impact assessment - Public participation – Addressing the issues related to the Project - Resettlement and rehabilitation– Policy, Regulation frame work and its amendment- Environmental and Social Management Frame work (ESMF).

MODULE IV MONITORING 9

Documentation of EIA - Environmental management plan– ISO 14000 - Plan for mitigation of adverse impact on environment -options for mitigation of impact on water, air and land, flora and fauna; Post project monitoring.