

B. Tech. III Semester VI

Subject Name : Environmental Impact and Risk Assessment

Subject Code: BTCL14603

Type of course : PEC-II

Prerequisite : Environment Science(BTMD17102)

Rationale : The purpose of EIA is to identify potential environmental impacts from proposals, such as projects and programs and to propose means to avoid or reduce the significant impacts. Also understand the concept of Environmental risk assessment.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
3	0	2	4	60	25	15	30	20	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Introduction to Environmental Impact Assessment : Emergence of EIA, History of EIA, Definition and Types of EIA, Objective and scope of EIA, Need for EIA studies, EIS, Project Types, Impacts and their Types, The EIA Process and Project Cycle, Screening, scoping, baseline, Advantages and Limitations of EIA.	8	18%
2	Impact Identification, Prediction and Evaluation Techniques: Methods of Impact Identification, Methods of Impact Prediction, and Impact Evaluation Techniques, Different methods of EIA, Public Participation, and Public hearing Procedure. Practical Consideration: Economic development and environmental degradation, Case studies on EIA for Industries and Infrastructure Projects.	10	24%
3	Environmental Audit: Concept and Objectives, Comparison with Environmental Impact Assessment, Applicability of environmental audit to industries, roles and responsibilities of environmental auditor. Environmental Management: Methodologies and benefits. Certification for Environmental Management System, International Standards For Environmental management, ISO – 14000, LCA.	12	28%

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4	Risk Assessment: Hazard identification, Hazard accounting, Scenarios of exposure, Fate and Behavior of toxics and persistent substances in the environment, Receptor exposure to Environmental Contaminants, Dose Response Evaluation, Exposure Assessment, Exposure Factors, Slope Factors, Dose Response calculations and Dose Conversion Factors, Risk characterization and Risk management, Risk estimation, Risk evaluation, Risk mitigation, HAZOP and FEMA methods, Risk communication and Risk Perception, comparative risks, Risk based decision making, Risk based environmental standard setting.	15	30%
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Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	20	15	10	15	15

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels (**Revised Bloom's Taxonomy**)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Environmental Impact Assessment	Dr. N. S. Raman and Dr. Y. R. M Rao	Laxmi Publications Pvt Ltd ISBN: 978-9352740925	2018	1 st
2	Theory and Practice of Environmental Impact Assessment	Abbasi and Ramesh	Discovery Publishing House	2003	1 st
3	Environmental Impact Assessment	A.K. Shrivastava	APH ISBN:978-8176484428	2003	1 st

4	Environmental Engineering and Management	Suresh K. Dhameja	S. K. Kataria & Sons, Delhi ISBN: 9789350144114	2014	1 st
5	Environmental Impact Assessment Methodologies	Anjaneyulu, Yerramilli, and Valli Manickam	BS Publications / BSP Books ISBN : 9789388305822	2020	3 rd
6	Global Environmental Risks	Kasperson, J.X. and Kasperson, R.E.	V.N. University Press, New York ISBN:9280810278	2003	1 st

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Explain the importance of EIA as an integral part of planning process(<i>R,U... cognitive level</i>)	15
CO-2	Compute various methods to predict the magnitude of impact using mathematical tool (<i>U,A,E,C... cognitive level</i>)	25
CO-3	Propose proper mitigation measures to avoid environmental impacts(<i>R,U,N... cognitive level</i>)	25
CO-4	Summarize the EIA report with Suitable environmental management plan (<i>R,U,N... cognitive level</i>)	20
CO-5	Review Concept of Environmental risk assessment (<i>R,U... cognitive level</i>)	15

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	2	2	2	1	-	-	-	-	2	-	2	-	2	-	1
CO-2	2	2	2	1	2	-	1	-	-	2	-	-	-	2	-
CO-3	2	2	2	1	-	1	2	2	2	2	2	-	-	2	2
CO-4	2	2	-	2	-	1	1	2	-	2	2	2	1	-	1
CO-5	-	1	-	1	-	-	2	-	-	-	-	-	1	1	-
Rationale*	8	9	6	6	2	2	6	4	4	6	6	2	4	5	4

Rationale*:

All CO's are compatible and matching to the derived POs to several extents. The Purpose of EIA is to identify Potential environmental impacts from proposals, such as projects and programs and to propose means to avoid or reduce the significant impacts. Also understand the concept of Environmental risk assessment.

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LIST OF PRACTICALS:

1. Study on Delphi Techniques
2. Study on existing EIA Report of Infrastructure Project
3. Study on Prediction and Methods for Assessment of impacts.
4. Case studies on EIA for Industries and Infrastructure projects
5. Study Public Hearing Notice
6. Exercise on HAZAN and HAZOP for Risk Assessment
7. Study of Various EIA and Audit Report.
8. Assignment on Risk Assessment

List of Open Source/learning website:

<https://nptel.ac.in/courses/120/108/120108004/> Lecture 1 Principle of Environment Management
Module 4 Environment Management
<https://nptel.ac.in/courses/127/105/127105018/> (Week 6) Lecture 26 to 30 Environmental Risk
Module 5 Risk Assessment