

Branch Name:	Transportation Engineering
Program Code:	ET211
Course Name:	Environment Impact Assessment of Transportation Project
Course Code:	2ET2110104T
Pre-requisite Course:	Environment Assessment

Course Objective:

1. To expose the students to the need, methodology, documentation and requirements of environmental and social impact assessment of Transportation Projects.
2. To expose the students to the need, methodology, documentation and usefulness of environmental impact assessment and to develop the skill to prepare environmental management plan.
3. To provide knowledge related to the broad field of environmental risk assessment, important processes that control contaminant transport and tools that can be used in predicting and managing human health risks.

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
5	3	2	-	5	24	60	16	40	-	-	-	-	100

Subject Contents				
Sr. No	Topic	Total Hours	Weight (%)	
1	Introduction: Concepts of environmental impact analysis, key features of National environmental policy act and its implementation, screening in the EIA process, utility and scope of EIA process, Environmental protection acts EIA at national level. Conceptual approach for environmental impact studies, planning and management of impact studies, matrix and network methodologies for impact identification, description of the affected environmental – environmental indic	10	25	
2	Prediction and Assessment of Impact on Air Environment: Basic information on air quality, sources of air pollutants, effects of air pollutants, key legislations and regulations, conceptual approach for addressing air environment impacts, impact prediction approaches, assessment of significance of impacts, identification and incorporation of mitigation measures	10	20	
3	Prediction & Assessment of Impact on Noise & Social Environment: Basic information on noise, key legislation and guidelines, conceptual approach for addressing noise environment impacts, impact prediction methods, assessment of significance of impacts, identification and incorporation of mitigation measures, Conceptual approach for addressing socio-economic impacts, traffic and transportation system impacts, visual impacts, scoring methodologies for visual impact analysis	10	20	
4	Decision Methods for Evaluation of Alternative: Development of decision matrix. Public participation in environmental decision making, Regulatory requirements, environmental impact assessment process, objectives of public participation, techniques for conflict management and dispute resolution, verbal communication in EIA studies	15	35	

Reference Books:

1. Canter L.W., Environmental Impact Assessment, McGraw-Hill, 1997
2. Betty Bowers Marriott, Environmental Impact Assessment: A Practical Guide, McGraw-Hill Professional, 1997.
3. Peter Morris & Riki Therivel, Methods of Environmental Impact Assessment, Routledge, 2001.
4. Denver Tolliver, Highway Impact Assessment, Greenwood Publishing Group, 1993.
5. R. K. Jain, L. V. Urban, G. S. Stacey, H. E. Balbach, Environmental Assessment, McGraw-Hill Professional, 2001.
6. Relevant IRC & CPCB codes.

List of Experiments:

1. Measurement of particulate matter (SPM) in air
2. Measurement of CO_x, NO_x, SO_x, HC in ambient air
3. Exhaust gas analysis of different vehicles
4. Estimation of total amount of pollutants generated daily on a stretch of highway

Open Ended Problems:

1. A case study of environmental impact assessment of proposed highway –railway project

Course Learning Outcome:

1. Understand need for environmental clearance, its legal procedure, need of EIA, its types, stakeholders and their roles.
2. Understand various impact identification methodologies, prediction techniques and model of impacts on various environments.
3. Identify, predict and assess impacts of similar projects based on case studies.
4. The student will also know about the legal requirements of Environmental and Risk Assessment for projects.

Tutorials:

1. Problems based on matrix and network methodologies for impact identification.
2. Problems based on prediction and assessment of impact on air environment due to transportation.
3. Problems based on prediction and assessment of impact on noise level due to transportation.
4. Problems based on development of decision matrix.

Group work:

Collect the data for air quality (emission level) and noise level near the problematic spots on road network. Analyze and prepare a brief report with suggestions for improvement. Present the report with group discussion.

Course Learning Outcomes (CLO):

After successful completion of the course the students shall be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand need for environmental clearance, its legal procedure, need of EIA, its types, stakeholders and their roles.	L-1, L-2
CLO2	Understand various impact identification methodologies, prediction techniques and model of impacts on various environments.	L-1, L-2
CLO3	Identify, predict and assess impacts of similar projects based on case studies.	L-1, L-2, L-3, L-4
CLO4	The student will also know about the legal requirements of Environmental and Risk Assessment for projects.	L-1, L-2

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with Pos & PSOs

	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	M	M	M	M	M			L	H			M	M	M	
CLO2	H	M	H	M			M				M	H	M		M
CLO3	H	M	M	M					M			M	M	L	
CLO4	M	M	M	M	M	L		L		M		M	M	M	

H: High, M: Medium, L: Low