

Master of Technology
Civil Engineering (Transportation)

01TR0104: Environmental Impact Assessment of Transportation Project

Objective of the Course: Objectives of introducing this subject at first year level in Masters of civil engineering are:

- To provide the basic understanding of environmental impact analysis.
- To make the students conversant with techniques of prediction and assessment on air, noise and social environment due to transportation projects.
- To give the concept of decision methods for evaluation of alternative proposals.

Credit Earned:4

Students learning outcomes:

After successful completion of the course it is expected that student will be able to..

1. To provide the basic understanding of environmental impact analysis.
2. To make the students conversant with techniques of prediction and assessment on air, noise and social environment due to transportation projects.
3. To give the concept of decision methods for evaluation of alternative proposals.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
3	0	2	4	50	30	20	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	Introduction	
	Concepts of environmental impact analysis, key features of National environmental policy act and its implementation	2
	Screening in the EIA process, utility and scope of EIA process, Environmental protection acts EIA at national level	2
	Conceptual approach for environmental impact studies, planning and management of impact studies.	2
	Matrix and network methodologies for impact identification.	2
	Description of the affected environmental – environmental indic.	2
2	Prediction and Assessment of Impact on Air Environment	
	Basic information on air quality	1
	Sources of air pollutants, effects of air pollutants	2
	Key legislations and regulations.	2
	Conceptual approach for addressing air environment impacts.	2
	Impact prediction approaches, assessment of significance of impacts.	1
	Identification and incorporation of mitigation measures.	2
3	Prediction & Assessment of Impact on Noise & Social Environment	
	Basic information on noise, key legislation and guidelines.	2
	Conceptual approach for addressing noise environment impacts.	1
	Impact prediction methods, assessment of significance of impacts.	1
	Identification and incorporation of mitigation measures.	1
	Conceptual approach for addressing socio-economic impacts.	2
	Traffic and transportation system impacts.	1
	Visual impacts.	1
	Scoring methodologies for visual impact analysis.	1
4	Decision Methods for Evaluation of Alternative:	
	Development of decision matrix.	3
	Public participation in environmental decision making.	2
	Regulatory requirements, environmental impact assessment process.	3
	Objectives of public participation.	2
	Techniques for conflict management and dispute resolution	3
	Verbal communication in EIA studies	2

Suggested lists of experiments

- 1.Measurement of particulate matter (SPM) in air
2. Measurement of COX ,NOX , SOX, 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

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	15%	10%	35%	20%	10%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:**Reference Book:**

1. Canter L.W., Environmental Impact Assessment, McGraw-Hill, 1997
2. Betty Bowers Marriott, Environmental Impact Assessment: A Practical Guide, McGraw-Hill Professional, 1997.
2. 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.

Web Resources

- <https://ocw.mit.edu/courses/environment-courses/>
- https://onlinecourses.nptel.ac.in/noc18_ce29/preview
- https://onlinecourses.nptel.ac.in/noc18_ge16/preview