

GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (TRANSPORTATION ENGINEERING) (13)

ENVIRONMENT IMPACT ASSESSMENT OF TRANSPORTATION PROJECT

SUBJECT CODE: 2711305

M.E. 1ST SEMESTER

Type of course: Compulsory

Prerequisite: Nil

Rationale: Due to industrialization in the country, the environmental pollution is increased. The vehicular traffic is also increased rapidly in the last five years. The environmental problems are also increased due to traffic. The study of the subject is necessary to understand the impact of traffic and industries on environment. The student should be familiar with the current National Environmental Policy and its standards such as Smoke emissions by the vehicles. The subject is useful for understanding the process of EIA at various levels. The subject is important for study on effect of the Air and Noise pollution on the environment. It is useful for finalization of various alternatives for reducing the Environmental impact of the pollutants

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2	2	5	70	30	20	10	20	0	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
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
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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 Outcome:

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.

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.