



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069051

Subject Name: Environmental Impact Assessment of Transportation Project

w. e. f. Academic Year:	2024-25
Semester:	1 st Semester
Category of the Course:	PEC

Prerequisite :	Nil
Rationale:	The objective of the course is to impart knowledge and skills of environmental issues related to transportation systems, concept of sustainability and related issues. 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

PO

No	Program Outcomes
01	Engage in critical thinking and research to develop solutions to multifold real-world problems.
02	Communicate effectively with the engineering community at large level on complex design tasks & write and present technical reports.
03	Demonstrate a high level of professionalism in handling multidisciplinary and complex traffic engineering problems.
04	Plan, assess, create, integrate, carry out, and oversee complex transportation infrastructure projects in a sustainable local and global context.
05	Address societal issues pertaining to transportation by offering technologically advanced, reasonably priced solutions while upholding high standards of ethics and professionalism.



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069051

Subject Name: Environmental Impact Assessment of Transportation Project

Course Outcome:

After Completion of the Course, Student will be able to:

No	Course Outcomes	RBT Level
01	Understand basics of environmental impact analysis.	R, U
02	Apply the techniques of prediction and assessment on air, noise and social environment due to transportation projects.	A
03	Apply the decision methods for evaluation of alternative proposals.	U, A
04	Suggest probable environmental impacts due to civil engineering projects.	U

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	Introduction to Environmental Impact Assessment (EIA) and Sustainable Transportation systems	02	5
2	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.	08	20



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069051

Subject Name: Environmental Impact Assessment of Transportation Project

3	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	08	20
4	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.	08	20
5	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	14	30
6	Case studies of highway, railway, seaport and airport projects, Study of Environmental Impact Assessment Guidance Manual for highways.	05	5
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
30	20	30	10	10	--

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

(a) Books:

References/Suggested Learning Resources:

1. Canter L.W., Environmental Impact Assessment, McGraw-Hill, 1997



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069051

Subject Name: Environmental Impact Assessment of Transportation Project

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.
7. Environmental Impact Assessment Guidance Manual for Highways, Ministry of Environment & Forests, Government of India, New Delhi.

(b) Open-Source Software (May not be open source but useful for the subject):

AERMODE view, EcoRisk view, Emission view, AUSTALview

Learning website:

MOOC Course

<https://nptel.ac.in/courses/105107210>

List of Laboratory/Learning Resources Required:

List 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
Estimation of total amount of pollutants generated daily on a stretch of highway

List of 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



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering (Transportation Engineering)

Course / Subject Code: ME01069051

Subject Name: Environmental Impact Assessment of Transportation Project

Major Equipment:

1. High volume sampler with absorbents, with 20.3 cm x 25.4 cm glass fiber filters for SPM and 2.5 For SO_x Potassium tetracholoro mercurate, For Co NIDR Analyser, For NO_x Polypropylene.
2. Spectrophotometer
3. Exhaust gas analyzer

* * * * *