

Elective (IV)

ENVIRONMENTAL IMPACT ASSESSMENT OF TRANSPORTATION PROJECTS

Course Objectives:

- Explain the concepts of environmental impact assessment and apply in the projects
- List and define various indicators such as terrestrial subsystems, Indicators aquatic sub systems, Socio-economic and able to Select various indicators for EIA studies.
- Explain the impacts of transportation related components on environment
- Explain and illustrate the methodologies for environmental impact assessment

Course Content

Branch	Subject Title	Subject Code	Credit allotted subject wise		
			L	T	P
M.E. (Transportation Engg)	Environmental Impact Assessments of Transportation Projects	MET-2232(A)	3	-	-

UNIT 1:

Introduction: Environment and its interaction with human activities - Environmental imbalances - Attributes, Impacts, Indicators and Measurements - Concept of Environmental Impact Assessment (EIA), Environmental Impact Statement, Objectives of EIA, Advantages and Limitations of EIA

UNIT2:

Environmental Indicators - Indicators for climate - Indicators for terrestrial subsystems - Indicators for aquatic subsystems - Selection of indicators - Socio-economic indicators - Basic information - Indicators for economy - Social indicators - Indicators for health and nutrition - Cultural indicators - Selection of indicators.

UNIT 3:

Environmental Impact Assessment for Transportation Projects: Basic Concepts, Objectives, Transportation Related Environmental Impacts – Vehicular Impacts – Safety & Capacity Impacts – Roadway Impacts – Construction Impacts, Environmental Impact

Assessment – Environmental Impact Statement, Environment Audit, Typical case studies

UNIT 4:

Environmental Issues in Industrial Development: On-site and Off-site impacts during various stages of industrial development, long term climatic changes, Greenhouse effect, Industrial effluents and their impact on natural cycle, Environmental impact of Highways, Mining and Energy development

UNIT 5:

Methodologies for Carrying Environmental Impact Assessment: Overview of Methodologies, Adhoc Checklist, Matrix, Network, Overlays, Benefit Cost Analysis, Choosing a Methodology, Review Criteria.

Course Outcomes:

At the end of the course, the student will be able to:

- CO1: To describe the environmental imbalances, indicators and explain the concept of EIA
- CO2: To identify and describe elements to be affected by the proposed developments and/or likely to cause adverse impacts to the proposed project, including natural and man-made environment;
- CO3: To identify the negative impacts and propose the provision of infrastructure or mitigation measures

REFERENCE BOOKS:

1. Jain, R.K., Urban, L.V., Stracy, G.S., (1991), "Environmental Impact Analysis", Van Nostrand Reinhold Co., New York
2. Rau, J.G. and Wooten, D.C., (1996), "Environmental Impact Assessment", McGraw Hill Pub. Co., New York
3. Canter, L.W., (1997), "Environmental Impact Assessment", McGraw Hill Pub. Co., New York
4. Grand Jean, E. Gilgen A., "Environmental Factors in Urban Planning", Taylor and Francis Limited, London, 1976.
5. UNESCO, (1987), "Methodological Guidelines for the Integrated Environmental Evaluation of Water Resources Development", UNESCO/UNEP, Paris

ELECTIVE –IV

Transportation Economics, Project Evaluation and Appraisal

Course Objectives:

- Learn the importance of highway economics, measurements of benefits due to improvements, Present concepts of operations.
- Learn the application of methods of economic evaluation to road way projects.
- Introduce the economic concepts of supply, demand, pricing and market structures

Course Content

Branch	Subject Title	Subject Code	Credit allotted subject wise		
			L	T	P
M.E. (Transportation Engg)	Transportation Economics, Project Evaluation and Appraisal	MET-2232(B)			
			3	-	-

Unit – I

Principles: Purpose and major considerations in Transport Economic analysis. Identification and measurement of transportation costs and benefits.

Unit – II

Cost and benefits. Capital cost, inflation cost, interest during construction, maintenance cost, road user costs, vehicle operating cost, accident cost, congestion cost and pricing, non-user cost and consequences. Savings and benefits, road-user benefits and consumer surplus. Social costs and benefits from transportation project options. Interest and vestcharge, concept of interest and vestcharge, rate of vestcharge, compound interest equations.

Unit – III

Methods of economic analysis, characteristics and basic understanding of the methods. Comparisons and limitations of various methods, ranking of independent alternative projects.

Unit – IV

Techno-economic feasibility studies and evaluation of alternative projects. Welfare economics, evaluation and appraisal of transport investments.

Unit – V

Special considerations for transportation economics in analysis for developing countries. Appraisal and evaluation of economic consequences of an urban bypass.

Course Outcomes:

At the end of the course, the students will be able to:

CO1: to apply the concepts and tools of microeconomics.

CO2: to understand basic concepts of economic analysis.

CO3: to understand depreciation and its application.

CO4: to appreciate the basic application of economics.

References Books –

1. L.R. Kadiyali, *Traffic Engineering and Transport Planning*.
2. Williumsen and Ortuzar, *Modelling Transport*.
3. Kanafani, Transp. *Demand Analysis*.
4. C. J. Khisty and B. K. Lall, *Transportation Engineering: An Introduction*, Prentice-Hall India, 2003. Hutchinson, B.G., *Principles of Urban Transport Systems Planning*, Scripta, McGraw-Hill, NewYork, 1974.
5. Khisty C.J., *Transportation Engineering - An Introduction*, Prentice Hall, NJ, 2007.
6. Papacostas C.S. and Prevedouros, P.D., *Transportation Engineering & Planning*, PHI, New Delhi, 2002.