GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering- Transportation Engineering
Subject Code - 3721322
Semester – II
Subject Name: Economic Evaluation of Transportation Projects

Type of course: Program Elective IV

Prerequisite: Nil

Rationale: Expanding investment in Infrastructure can play an important counter cyclical role. Indian's rate of urbanization is very high. There is need for sound infrastructure becomes paramount. The aim of a good transportation system is to provide an efficient, quick and safe transportation to its users. These parameters are counted as the benefit of transportation. The subject includes the study of laws of demand and supply. It also includes the study of various methods of estimating National Income. In the study, various methods of economic evaluations are covered. It also discusses the present road scenario, its future growth and financing strategies for highway projects with reference to Indian context.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Introductions –Need for Economic Evaluation; Principles of economic evaluation; Welfare economics; Social costs, Vest change, Rate of return. Value of Travel time Savings; Economic concept of evaluation of travel time savings, Issues connected with evaluation of travel time savings. Vehicle operating costs; Components of VOC, Road user Cost study in India; Accident costs; Methodologies for economic evaluation of an accident; Factors involved	5
2	Demand and Utility, Laws of Demand, Utility analysis, Ordinal analysis, Income effect, Price effect, Demand curves, Elasticity of supply	5
3	National Income, GNP, GDP, Methods of Estimating National Income	5
4	Project Appraisal – Total Cost, Principles of analysis, Road Users Cost – Factors, Benefits. Types of Capital Financing; valuation; Project appraisal by shadow pricing with case studies. Economic Analysis of BOT and BOOT projects and allocations. Introduction and scope of asset management in India.	5
5	Economic Evaluation – Different Methods, Sensitivity analysis. Maintenance Cost – Factors, Methods. Traffic System Evaluation.	10
6	Financing Mechanism - Taxes, Tolls, Private Financing	5
7	Transport Cost – Types, Factors, Cost analysis for Mass Transit System, Pricing – Marginal Cost Pricing, National Policy, Fares, Subsidy.	5
8	Economic analysis of transportation projects ownership and financing of transport, economic function of transportation road user and transportation costs, highway finance and taxation, case studies of analysis and evaluation of transportation projects. Basic concepts, Objectives, Transportation related Environmental Impacts - Vehicular Impacts –	5

	Safety and Capacity Impacts - Roadway Impacts – Construction Impacts, Environmental Impact Assessment-Environmental Impact Statement, Environment Audit, Typical case studies.	
	TOTAL HOURS	**45**

Suggested Specification table with Marks (Theory): (For ME only)

Distribution of marks weightage for cognitive level

Bloom's Taxonomy for Cognitive Domain	**Marks Weightage (%)**
Recall	10
Comprehension	15
Application	30
Analysis	20
Evaluate	15
Create	10

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. D. M. Mithani, Economic Analysis – (Himalaya)
2. IRC– SP -30, Manual on Economic Evaluation of Highways in India.
3. Fair and Williams, Economics of Transportation, Harper and Brothers, Publishers, New York, 1959.
4. R.Winfrey, Economic Analysis for Highway International Textbook Co., Pennsylvania. USA,1969
5. G.Harrl Clell, A Manual for the Economic Appraisal of Transport Projects, World Bank Report, Washington D.C.1980.
6. Heggie. I.G, Transportation Engineering Economics, McGraw Hill Publishers.
7. Winfrey. R, Economic Analysis for Highways, International Text Book Company.
8. L. R. Kadiyali , Traffic Engineering and Transport Planning -, Khanna Publishers.
9. Road User Cost Study, CRRI.
10. J. W. Dickey, Road Project Appraisal for Developing Countries, John Wiley & Sons.
11. B.Sengupta, H.Guha, Construction Management & Planning, Tata McGraw Hill, New Delhi

Course Outcomes: At the end of the course, Student will be able

Sr. No.	**CO statement**	**Marks % weightage**
CO-1	To identify and evaluate the demand and utility for transport project	20%
CO-2	To prepare an alternative strategy for stage construction or full construction;	10%
CO-3	To analyse future cash flows considering all the consequences and how it can be brought under a common time datum without extending period	20%

	beyond reliable forecasts.	
CO-4	To evaluate the project economics strength using different methods for economic evaluation.	40%
CO-5	To examine the viability of transportation project through economic and financial analysis of transportation	10%

List of Tutorials:

1. Problems based on demand and supply, elasticity analysis.
2. Problems based on estimation of National Income.
3. Problems based on different methods for economic evaluation, like B/C ratio, NPV, IRR etc.
4. Problems based on deriving transport cost.
5. Cost analysis for mass transit system.
6. Problems based on toll fixation.
7. Computer applications for the above problems