

# GUJARAT TECHNOLOGICAL UNIVERSITY

## CIVIL (TRANSPORTATION ENGINEERING) (13) RAIL TRANSPORTATION SYSTEM PLANNING AND DESIGN SUBJECT CODE: 2711306 M.E. 1<sup>st</sup> SEMESTER

**Type of course:** Major Elective

**Prerequisite:** Nil

**Rationale:** The Rail transportation system is one of the essential transportation systems for at National Level. It carries the largest passengers and goods traffic at National level. The study of the Railway structures is necessary for any transportation engineer. Complete knowledge of demand analysis, forecasting of passengers and freight is required for design of the rail transportation system. The subject includes the study of pricing principles, analysis and design of rail transportation system. The student should be familiar with rail system analysis and planning. The case study is essential to understand the design and management aspects

**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	Rail Transportation System: Railway Track system & sub-structures, Railway infrastructure, Modernization in track, safety in railways, under-ground railways	5	20
2	Demand analysis and forecasting for passenger and freight traffic costing and pricing principles, project analysis and design	10	20
3	Project interdependencies and programming techniques	10	20
4	Rail systems analysis and systems planning; macroeconomic transportation simulator	10	20
5	Case studies and implementation strategies	10	20

**Reference Books:**

1. Saxena S.C., Railway Engineering, Dhanpat Rai & Sons, 1995

**List of Experiments:**

1. Planning and design of railway network, routes and schedules for the actual or hypothetical regional area development.
2. Planning and design of infrastructures required for railways

**Open Ended Problems:**

A case study of any Gauge Conversion project

**Course Outcome:**

1. To enhance the knowledge of Railway Engineering in the context of regional mass transportation systems.
2. To provide techniques of planning, modeling and designing the transportation systems along with infrastructures required for Railways.
3. To make the students aware of the environmental and other impacts impended due to Railway projects.

**Tutorials:**

3. Problems based on forecasting of passenger and freight traffic for railways.
4. Problems based on costing and pricing strategy in railways
5. Planning and design of railway network, routes and schedules for the actual or hypothetical regional area development.
6. Planning and design of infrastructures required for railways.

**Field Visit:**

1. Visit to the Railway station, yards and management office.