

01TR0103: Rail Transportation System Planning and Design

Objective of the Course: Objectives of introducing this subject at first year level in Masters of civil engineering are:

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

Credit Earned: 4

Students learning outcomes:

After successful completion of the course it is expected that student will be able to..

1. To enhance the knowledge of Railway Engineering in the context of regional mass transportation systems.
2. To calculate demand of passenger and freight traffic by various forecasting techniques.
3. To understand railway system planning with help of various macroscopic models, safety aspect and environmental impact assessment of railway transportation system.
4. To describe the project inter dependencies and programming technique for railway transportation system

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
3	0	2	4	50	30	20	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	Rail transportation system	
	Railway Transportation and it development	2
	Railway track system & sub-structures.	2
	Railway infrastructure.	2
	Modernization in track	2
	Safety in railways.	2
	Underground railways.	2
2	Demand analysis	
	Demand analysis and forecasting for passenger	2
	Freight traffic costing	2
	Pricing principles	2
	Project analysis and design	4
3	Project	
	Project interdependencies and programming techniques.	07
4	Rail system analysis and system planning	
	Macroeconomic transportation simulator	07
5	Case Studies	
	Case studies and implementation strategies, Environmental Impact	06

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	15%	10%	35%	20%	10%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:**Reference Book:**

1. Satish Chandra and M.M. Agrawal, Railway Engineering, Oxford University Press, New Delhi
2. S.C. Saxena and S. P. Arora, A Text Book of Railway Engineering, Dhanpat Rai & Sons, New Delhi
3. S.C. Rangwala, K.S. Rangwala and P.S. Rangwala, Principles of Railway Engineering, Charotar Publishing House, Anand.

Web Resources

- <http://nptel.ac.in/>
- <https://ocw.mit.edu/courses/transportation-courses/>
