01TR0304: Transportation Facility Design

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

- To make the students aware of designing of the Highways
- To develop concepts related Terminal functions, analysis of terminals, process flow charts of passenger & goods terminals
- To learn basic principles of design of intersections, signal coordination

Credit Earned:4
Students learning outcomes:

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

1. To pick up understanding of principles of designing of Highways.
2. To study the importance of the Terminal and its components
3. To apply the various aspects of Signal design and its Co-ordination

Teaching and Examination Scheme

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

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Introduction**	**7**
	Design of highways, design of at-grade intersections, design of signalized intersection, design of grade separated intersection, terminal design, and design of facilitiesfor non-motorized transport	
2	**Terminal Planning & Design:**	**11**
	Terminal functions, analysis of terminals, process flow charts of passenger & goods terminals, terminal processing time, waiting time, capacity & level of service concept, study of typical facilities of highway, transit, airport and waterway terminals, concept of inland port.	
3	**Design of Highways:**	**10**
	Hierarchy of highway system, functions, design designations, concepts in horizontal & vertical alignment, integration, optical design, geometrical standards for mobility & accessibility components, landscaping and safety considerations, evaluation and design of existing geometrics	
4	**Design of Intersections:**	**10**
	Review of design of at-grade intersections, signal coordination–graphic methods & computer techniques, grade separated intersections –warrants for selection, different types & geometric standards, spacing & space controls, ramps & gore area design.	

Suggested lists of experiments

1. Problems based on design of at-grade intersections, signalized intersection.
2. Problems based on design of grade separated intersections.
3. Problems based on design of facilities required for non-motorized transport and pedestrians.
4. Problems based on design of terminals for passenger and goods on highway, railway, airport and waterway port.
5. Problems based on design of horizontal and vertical alignment of highways with landscaping and safety aspects.

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. Kadiyali, L.R., Traffic Engineering and Transport Planning, Khanna publishers.
2. IRC-SP41: Guidelines for the Design of At-Grade Intersections in Rural & Urban Areas
3. Salter, R J., Highway Traffic Analysis and Design, ELBS. 4. Edward K. Morlock, Introduction to Transportation Engineering & Planning, International Student Edition, Mc-Graw Hill Book Company, New York.

Web Resources

- http://nptel.ac.in/
- www.scilab.org/

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