INSTITUTE	**FACULTY OF TECHNOLOGY**
PROGRAM	**BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)**
SEMESTER	**7**
COURSE TITLE	**MODERN TRANSPORTATION SYSTEM**
COURSE CODE	**01CI1707**
COURSE CREDITS	**4**

Objective:

1. To gain a deep understanding of the dynamics of transportation within urban environments, including factors such as population density, land use patterns, economic activities, and demographic trends
2. To explore sustainable transportation solutions aimed at mitigating the negative impacts of transportation on the environment and society.
3. To encourage interdisciplinary perspectives by incorporating insights from fields such as urban planning, engineering, economics, environmental science, sociology, and public policy.

Course Outcomes: After completion of this course, student will be able to:

1. Specify key concepts related to urbanization.
2. Analyze various transportation survey data with proper sample size, accuracy and consistency checks
3. Evaluate transportation data using appropriate analytical and techniques.
4. Develop optimal bus route network design and scheduling

Pre-requisite of course: Traffic Characterristic and road geometry

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	1	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Urban Mass Transportation System** Urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, Capacity, merits and comparison of systems, coordination, types of coordination	6

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Contents : Unit	Topics	Contact Hours
2	**Introduction to Land Use Planning Models, Land Use and Transportation Interaction.** The transportation study area definition; division into traffic zones; network identification and coding, Types of trips, characteristics of various surveys; home interview; roadside survey mass transit and intermediate public transport surveys; sampling and expansion factors; accuracy checks, screen line checks, consistency checks	8
3	**Travel Demand Modeling** Trip generation-zonal regression and category analysis, Trip distribution-growth factor models, gravity model, opportunity models, Desire line diagram. Modal split analysis-trip end., Trip interchange models, logit models, Trip assignment techniques choice, diversion curves, shortest path algorithms, all-or-nothing assignment, capacity restraint models and Direct demand models	15
4	**Scheduling and Route Network Design** Scheduling: - component, procedure and patterns, bus & crew scheduling, fleet requirement, Route network design: - corridor identification, route system, capacity of transit lines, process for improving transit line capacity, Bus Station Design: Bus-Station Interface, Station Layout and Size, Distance between Stations, Architectural Features, Terminal Design, Universal Accessibility for Corridor: Footpaths, Pedestrian Infrastructure, Passenger Access, Station Ramps, Bus Interior, Bus Stops on Service Extensions.	13
Total Hours		**42**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Tutorial-1** Determine the trip generation of a network	2
2	**Tutorial-2** Determine the trip distribution of the selected study area using the growth factor method.	2
3	**Tutorial-3** Determine trip distribution using the Gravity model and Opportunity Models	2
4	**Tutorial-4** Determine the modal split of the particular flow	2
5	**Tutorial-5** To carry out a detailed schedule and route design for the BRTS bus for a metropolitan city.	2
6	**Tutorial-6** To carry out a detailed transportation survey, including the study area, zonal division, and network identification.	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
7	**Tutorial-7** Determine passenger & vehicular capacity of mass transportation system	2
Total Hours		**14**

Textbook :

1 Traffic Engineering and Transport Planning, Kadiyali L.R.,, Khanna Publishers, 2002

References:

1 Transportation Engineering-An Introduction, Transportation Engineering-An Introduction, Khisty, C J., Prentice-Hall, NJ, 2002

Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
5.00	10.00	30.00	30.00	15.00	10.00

Instructional Method:

1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course.

2 Lectures shall be conducted in class room using various teaching aids

3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation

4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.

Supplementary Resources:

1 https://onlinecourses.nptel.ac.in/noc21_ce35/preview?