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Birla Institute of Technology & Science, Pilani
Hyderabad Campus

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI- HYDERABAD CAMPUS

II SEMESTER 2019-2020

Course Handout (Part -II)

July 9, 2024

In addition to part I (General Handout for all courses appended to the time table) thisportion gives further specific details regarding the course.

Course No.: CE G524
Course Title: Urban Mass Transit Planning, Operations and Management

Instructor-in-charge: Dr. Prasanta K. Sahu

Course Description

Modes of public transportation and application pf each to urban travel needs; Comparison of transit modes and selection of technology and transit service; Estimating demand in transit planning studies and functional design of transit routes; Terminal design; Management and operation of transit systems, Model for operational management; Fleet and crew management; Terminal management; Fiscal management

1. Scope and objectives of the course:
   The course intends to equip the students with sufficient technical knowledge on mass transit planning, operations and management. The course covers the historical evolution of transit in cities; the technological innovations which made transit possible; and transit mode definitions and travel regimes. Critical planning concepts such as scheduling; level of service; capacity; and networks, particularly estimation of transit demand, route planning and terminal design are addressed. Transit operating agencies' organizational structures and operational procedures are introduced.The course would also include operation and management of transit systems, fleet and crew management, terminal management and fiscal management. Qualitative and quantitative planning objectives and models are presented; the importance of ITS technology in transit operation is evaluated. Methods to evaluate and select potential transit modes are described.
2. Textbook(s):

Text Book (TB)

1. Vuchic Vukan R.; *Urban Transit: Operations, Planning and Economics; John Wiley & Sons, Inc.*; 2005.
2. Vukan R. Vuchic, Urban Transit Systems and Technology, John Wiley & Sons, Inc. 2007 Edition

Reference Books (RB)

1. Black, Alan; *Urban Mass Transportation Planning;* McGraw-Hill Inc., 1995
2.Sarkar, P.K., Maitri, V., and Joshi, G.J. Transportation Planning, Principles, Practices and Policies, PHI Pvt. Ltd., Second Edition, 2017

Note: Handouts will be distributed time to time.

Lecture wise Course Plan

Lecture No.	Learning Objective	Topics Covered	Reference to TB, RB
1 - 3	History of urban transit	Major movers of earlier centuries, subway and elevated systems, arrival of motor vehicles, decline of streetcar.	Ch 2 (TB 1)
4 - 7	Urban transit modes	Suburban railroad, heavy rail, light rail, bus, rail versus bus, comparison of modes.	Ch 5 (TB 1), Ch 2 (RB 1), Ch 2 (TB 2)
8 - 10	Para-transit	Dial-a-ride, taxi, jitney, ride sharing and other modes.	Ch 6 (TB 1), Ch 2 (TB 2)
11 - 13	Innovative technology	Personal rapid transit, people movers, rail transportation, guided bus-ways.	Ch 7 (TB 1)
14 - 23	Planning transit networks	Planning process, planning methodology, transportation networks, travel demand forecasting, configuration of network, spacing of routes, spacing of stops, frequency of service.	Ch 8(TB 1)
24 - 26	Urban Bus Rapid Transit System	Definition and case studies with success stories.	Handout
27 - 30	Transit system performance	Line capacity, station capacity, theoretical and practical capacities of modes, quantitative performance measures.	Ch 7(RB 1)
31 - 35	Operations and Management	The operating cycle, scheduling, special service pattern, fare collection, marketing.	Ch 9 (RB 1)

36 - 38	Transit and urban development	Symbiotic relationship, impact of transit, land-use theory and simulation, measuring benefits of transit, issue of desirable urban form	Ch 18 (RB2)
39 - 40	Policies for the future	Future trends, major policy issues, land use policy, solving urban transportation problems.	Ch 16 (RB 1)
41 - 42	Analysis, evaluation and selection of transit modes	Definition of conditions set, Formulation, comparison and selection of candidate modes, Transit systems planning, Planning and selection of medium- and high-performance transit modes.	Ch 10 (TB 1), Ch 11 (TB 1), Ch 12 (TB 1)

Evaluation Scheme

E. C. No.	Evaluation component	Duration	Weightage	Date, time	Nature of component
1	Mid-semester test	90 min	25%	3/3 11.00 - 12.30 PM	CB
2	Comprehensive	3 hours	35%		CB
3	Assignments/ Term paper/ project/Seminar/Quiz	-	40%	04/05 AN	OB

Chamber Consultation Hour: To be announced in the class.

Notices: All Notices concerning to the course will be displayed on **CMS and Notice Board** of Civil Engineering Department.

Make up policy: Makeup will be given only to the genuine cases with prior permission.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge

CE G524