

**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI- HYDERABAD CAMPUS**

**II SEMESTER 2019-2020**

**Course Handout (Part -II)**

**January 4, 2020**

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.

1. 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

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| --- | --- | --- | --- |
| 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**

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| --- | --- | --- | --- | --- | --- |
| **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**