

SHIV NADAR UNIVERSITY
UNDERGRADUATE COURSE PROPOSAL

- I. **COURSE TITLE:** PUBLIC TRANSPORT SYSTEMS
- II. **COURSE CODE:** CED 421
- III. **COURSE CREDITS (L:T:P):** 2:0:0
- IV. **COURSE TYPE (MAJOR/UWE/CCC/REAL/VELS/IC), PLEASE MENTION ALL THAT APPLIES:** UWE (Major Elective V)
- V. **PREREQUISITE/S (IF ANY):** None
- VI. **COURSE COORDINATOR/INSTRUCTOR(S):** Dr. Shalini Rankavat
- VII. **SCHOOL/ DEPARTMENT:** SoE/Civil Engineering
- VIII. **DISCIPLINES TO WHICH THE COURSE MAY BE OF INTEREST:** All
- IX. **Objectives:** The objective of this course is to describe the evolution and role of urban public transportation modes, systems, and services, focusing on bus and rail. Technological characteristics and their impacts on capacity, service quality, and cost will be described. Current practice and new methods for data collection and analysis, performance monitoring, route design, frequency determination, and vehicle and crew scheduling will also be discussed. In addition, the effect of pricing policy and service quality on ridership and methods for estimating costs associated with proposed service changes will be presented together with means to improve operations through real time intervention.
- X. **Learning Outcomes:** After successful completion of this course, student will -
- have a clear conceptual understanding of key challenges of public transport systems design and operations
 - comprehend the interactions between the different components of public transport design and operations, i.e. service quality, passenger demand, infrastructure, transit operations and evaluation
 - be familiar with the current challenges of public transport systems in South Africa and have a critical understanding of their implications for the competitiveness of public transport
 - be equipped to do basic calculations on transit line capacity, scheduling and network design

XI. Course Content:

1. **Transit System** : Capacity, Work and Utilization; Factors influencing Transit Travel; Scheduling of Service
2. **Estimation of Transit Demand:** Transit Line Capacity; Elements of line capacity; Capacity Computations; Relationship between capacity and other performance elements
3. **Route planning techniques:** Transit Stops; Sensitivity of Transit speeds to elements of Cycle time; Stops and Stopping Regimes; Skip-stop operation
4. **Bus Scheduling:** Scheduling of Single track lines, circle lines and Trunk lines; Transit System Modeling; Optimization of Rolling Stock; Analysis of Delay propagation on a transit line; Transit Lines and Networks; Network operating efficiency;
5. **Transit Corridor identification and planning:** Geometry of transit lines; Line alignments; Types of transit lines and their characteristics; Timed transfer system Scheduling
6. **Integration of Public Transportation Modes:** Transit network types and their characteristics; Rail transit network types and their characteristics; Analysis of Metro networks and geometric forms; Classification of metro network measures and indicators; Network Topology; Planning of Rail Transit Station Locations; Application of theoretical Analysis to Rapid Transit station planning; Attraction of passengers; Cost of stations; Auto-transit Interface

XII. RECOMMENDED BOOKS:

Text Book:

1. Vukan R. Vuchic, “*Urban Public Transportation: Systems and Technology*”, 1st Edition, Prentice-Hall; 1st edition (1981).

Reference Books:

1. Vukan R. Vuchic, “*Urban Transit : operations, planning and economics*”, New.Jersey. : J. Wiley & Sons, ©2005
2. Ceder, Avishai and Haifa, Israel, “*Public transit planning and operation : theory, modelling and practice*”, London ; Burlington, MA : Elsevier , ©2007

XIII. ASSESSMENT SCHEME:

Theory

Assignments:	20%
Quizzes	15%
Mid Term Exam:	30%
Final Exam:	35%

Total: 100%