

# **SHRI VENKATESHWARA UNIVERSITY**



## **Syllabus**

**M.TECH (Highway Engineering)**

**PART-TIME**

**(Two Years Post Graduation Programme)**

**(w.e.f. 2019-20)**

**SCHOOL OF ENGINEERING &  
TECHNOLOGY**



## **M.Tech V Semester**

### **WHE- 052: TRANSPORTATION SYSTEM MANAGEMENT**

**Course Type: Elective; Instruction: L-T-P-C: 3-0-0-3**

**Course Outcomes:** *At the end of the course, students will be able to*

CO1	Understand TSM, the need for TSM and the objectives of TSM.
CO2	Understand the types of TSM strategies.
CO3	Apply a strategy based on a TSM goal or objective.
CO4	Recommend methods to manage a transit system to improve its management efficiency.
CO5	Understand transportation demand management (TDM), various TDM strategies and their applicability.
CO6	Recommend a detailed transportation demand management strategy for a transportation system based on a goal or objective.

#### **Detailed Syllabus:**

##### **Transportation System Management:**

Objectives; Need for TSM Long – Range vs. TSM Planning; TSM Actions: Traffic Management Techniques for Improving Vehicular Flows, Preferential Treatment for High occupancy Modes; Promoting Non – Auto and High Occupancy vehicles; Transit and Intermediate Public Transport service Improvements, Demand Management Techniques for Reduced Traffic Demand, Staggered working Hours, Vehicular Restrictions, Intersection Management Techniques – Signal Progression – Optimisation

##### **Transit System Management:**

Multimodal traffic management, Reducing transportation needs, Reducing dependence on car, Improving traffic flow, Improving road safety, Route Planning and Scheduling.

##### **Transportation Demand Management:**

Usage of Personal Vehicle, Non-motorized Transport and Public Transit, Policies to Control Vehicle Growth Rate, Alternative work schedules, Congestion pricing, Employer incentives and disincentives, Land-use reorientation, ICT applications.

##### **Traffic Administration:**

Legislative Authority; Functional Responsibilities; Organisation – UMTA – State Highway Department; Traffic Records; Research Bodies; Citizen Participation, Asset Management

#### **READING:**

1. Institute of Transportation Engineers. Anurag Pande and Brian Wolshon, Traffic Engineering Hand Book, Seventh Edition, Prentice Hall, 2016
2. ITE, Transportation System Management and Operations: Action Kit – Immediate Solutions for Transportation Operational Issues, FHA, ITE, 2005
3. Khisty CJ and BK Lall, Transportation Engineering: An Introduction Prentice Hall International, Inc., 2012
4. Stephen Ison and Tom Rye (Editors), The Implementation and Effectiveness of Transport Demand Management Measures: An International Perspective, Ashgate Publishing Company, 2008
5. Sunil Sharma, Travel Demand Management, Rajat Publications, 2007

## **WOE- 555: COMPOSITE MATERIALS**

**Course Type: Elective; Instruction: L-T-P-C: 3-0-0-3**

**UNIT-I:** INTRODUCTION: Definition – Classification and characteristics of Composite materials. Advantages and application of composites. Functional requirements of reinforcement and matrix. Effect of reinforcement (size, shape, distribution, volume fraction) on overall composite performance.

**UNIT – II:** REINFORCEMENTS: Preparation-layup, curing, properties and applications of glass fibers, carbon fibers, Kevlar fibers and Boron fibers. Properties and applications of whiskers, particle reinforcements. Mechanical Behavior of composites: Rule of mixtures, Inverse rule of mixtures. Isostrain and Isostress conditions.

**UNIT – III:** Manufacturing of Metal Matrix Composites: Casting – Solid State diffusion technique, Cladding – Hot isostatic pressing. Properties and applications. Manufacturing of Ceramic Matrix Composites: Liquid Metal Infiltration – Liquid phase sintering. Manufacturing of Carbon – Carbon composites: Knitting, Braiding, Weaving. Properties and applications.

**UNIT-IV:** Manufacturing of Polymer Matrix Composites: Preparation of Moulding compounds and prepregs – hand layup method – Autoclave method – Filament winding method – Compression moulding – Reaction injection moulding. Properties and applications.

**UNIT – V:** Strength: Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first ply failure-insight strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using caplet plots; stress concentrations.

### **TEXT BOOKS:**

1. Material Science and Technology – Vol 13 – Composites by R.W.Cahn – VCH, West Germany.
2. Materials Science and Engineering, An introduction. WD Callister, Jr., Adapted by R. Balasubramaniam, John Wiley & Sons, NY, Indian edition, 2007.

### **References:**

1. Hand Book of Composite Materials-ed-Lubin.
2. Composite Materials – K.K.Chawla.
3. Composite Materials Science and Applications – Deborah D.L. Chung.
4. Composite Materials Design and Applications – Danial Gay, Suong V. Hoa, and Stephen W. Tasi.

## **WHE-521: DISSERTATION PHASE- I**

**Course Type: Core; Instruction: L-T-P-C: 0-0-20 (10)**

**Course Outcomes:** *At the end of the course, students will be able to*

CO1	Define Research Problem Statement.
CO2	Critically evaluate literature in chosen area of research & establish Scope of work.
CO3	Develop Study Methodology.
CO4	Carryout Pilot Study.

### **Detailed Syllabus:**

There is no prescribed syllabus. Students are required to search, collect and review various research articles published in chosen area of research. A student has to select a topic for his dissertation, based on his/her interest and the available facilities at the commencement of dissertation work. A student shall be required to submit a dissertation report on the research work carried out by him/her.

### **READING:**

1. Conference / Seminar Proceedings.
2. Derek Swetnam, Writing Your Dissertation, 3<sup>rd</sup> Edition, Oxford, UK, 2004.
3. Handbooks / Research Digests.
4. Journal Publications.

