

Devi Ahilya University, Indore, India Institute of Engineering & Technology			
Subject code and name	Type	L-T-P	Credits
	L	T	P
VLR7C1: Transportation Engineering - II	PC	3-1-1	4+1(P)

**Objective of the subject:**

- To know about various pavement materials.
- To know about procedure of designing pavements
- To know about method of construction of different pavements.
- To know about traffic principles

**COURSE CONTENTS**

**Unit I: Pavement Materials and Mix Design:** Subgrade soil properties, CBR test, aggregates, desirable properties, tests, bituminous materials, bitumen and tar, tests. Bituminous mixes, requirements, design, Marshall Method. pavements.

**Unit II: Design of Pavements:** Types of pavement structures, functions of pavement components, design factors. Design of flexible pavements, methods, GI method, CBR method, IRC method, Burmister's method. Design of rigid pavements, design considerations, wheel load stresses, temperature stresses, frictional stresses, design of joints, IRC method of rigid pavement design.

**Unit III:**

**Highway Construction :** Types of highway construction, construction of earth roads, gravel roads, WBM roads. Bituminous pavements, types, surface dressing, penetration macadam, built up spray grout, bitumen bound macadam, bituminous carpet, bituminous concrete. Cement concrete, Pavement failures, causes, failures in flexible pavements and rigid pavements.

**Unit IV: Traffic Engineering Principles:** Traffic characteristics; components of traffic stream: flow-speed Density, measurement and analysis, q-k-v relationships, design hourly volume, concept of EPCU, capacity and level of service. Parking studies and accident studies. Design of intersections, at grade intersections, channelized and rotary. Introduction to grade separated intersections, cloverleaf, trumpet, flyovers. Traffic regulations, one-way streets, traffic signs, road markings, signals, warrants.

**UNIT V: Airport Planning, Runway & Taxiway: Airport site selection. air craft characteristic** and their effects on runway alignments, windrose diagrams, basic runway length and corrections, classification of airports.

**Airport, Obstructions, Lightning & Traffic control: Zoning regulations, approach area,** approach surface-imaginary, conical, horizontal. Rotating beacon, boundary lights, approach lights, runway and taxiway lighting etc. instrumental landing system, precision approach radar, VOR enroute traffic control.

## REFERENCES

1. Khana .S.K, Justo .C.E.G – “Highway Engineering,” Nemchand & Bros, Rookies. 2001.
2. Chakroborty, P. and A. Das Principles of Transportation Engineering, Prentice Hall of India Pvt. Ltd, New Delhi, India, 2005.
3. Rangwala SC; Railway Engineering; Charotar Publication House, Anand
4. Railway Engineering by Arora & Saxena - Dhanpat Rai & Sons
5. Kadiyali .L.R, “Traffic Engineering And Transport Planning”, Khanna publishers, Delhi,2009.
6. Ministry of Road Transport and Highways. Specifications for Road and Bridge Works, Fourth Edition, Indian Roads Congress, New Delhi, India, 2001.
7. IRC Codes of Practices
8. Jotin Khisty C. and B. Kent Lall. Transportation Engineering – An Introduction, Third Edition. Prentice Hall of India Pvt. Ltd, New Delhi, India, 2002.
9. Rao G.V. Principles of Transportation and Highway Engineering, Tata McGraw-Hill Publishing Company Ltd., New Delhi, India, 1996.
10. McShane, W.R. and R.P. Roess Traffic Engineering, Prentice Hall, New Jersey, USA, 1990.

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

- Design Intersections and prepare traffic management plans.
- Design flexible and rigid pavements.
- Understand the principles of construction and maintenance of highways
- Estimate basic characteristics of traffic stream
- Conduct traffic studies and analyze traffic data