

K L UNIVERSITY**TRANSPORTATION ENGINEERING (11-CE303)****Pre – requisite: NIL**

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SYLLABUS

Transportation Development and Planning: Importance of Transportation Engineering, Classification of Transportation Studies – Modal, Elemental & Functional Classification. Historical Development of Road Construction, Highway Development in India. **Highway Alignment** -Factors governing alignment; Engineering surveys. **Highway Geometric Design:** Introduction, Highway cross-section elements; Sight distance – SSD, ISD, OSD; Design of horizontal alignment; Design of vertical alignment – summit curves and valley curves. **Pavement Design Engineering:** Pavement types, components of flexible & rigid pavements, Pavement Design Factors, Flexible Pavement Design - Design strategies, CBR Method, Burmister’s Layered Theory, IRC 37-2001 Guidelines, Rigid Pavement Design - General Design Considerations, Stresses in concrete pavements, Joints, Design of Rigid Pavements as per IRC:58-2002 Guidelines. Pavement Drainage - Necessity, Analysis and Design of Surface and sub surface drainage system. **Highway Construction:** Equipment, Stages of Pavement Construction, Earthwork, Stabilization of Soil, Bituminous Pavement Construction and Cement Concrete Pavement Construction. **Highway Maintenance:** Pavement Distress – causes and remedial measures. **Traffic Infrastructure Design:** Properties of Traffic Engineering Elements – Introduction, Vehicle Characteristics, Human Factors and Driver Characteristics, Road Characteristics, Control Mechanisms and Terminal Facilities. Traffic Studies, Traffic Operations –Traffic Regulations, Traffic Control Devices - Traffic Signs, Traffic signals, Road Markings and Islands. Traffic Stream Parameters and their Relations; Design of Traffic Signals, Design of Intersections – Intersection at Grade and grade separated Intersections.

TEXT BOOKS:

1. Principles of Transportation Engineering by Partha Chakroborty and Animesh Das. Prentice Hall of India, New Delhi
2. Highway Engineering by S.K.Khanna & C.J.Justo, Nemchand & Bros., Latest Edition.

REFERENCE BOOKS:

1. Principles of pavement design – Yoder & wit zorac – Jhonwilley & Sons
2. Principles and practices of highway Engineering by Dr. L. R. Kadiyali & Dr. N. B. Lal Khanna publishers, Latest Edition .
3. Transportation Engineering by C. Jotin Khisty, B.Kent Lall, Prentice Hall of India, New Delhi
4. Traffic Engineering and Transportation Planning by L.R.Kadiyali, Khanna Publishers

CODES:

1. IRC 37 – 2001: Guidelines for the design of flexible pavements, Indian Road Congress Publications, New Delhi.
2. IRC 58 – 2002: Guidelines for the design of plain jointed rigid pavements for highways, Indian Road Congress Publications, New Delhi.
3. MORTH - Specifications for Road and Bridge works, Indian Road Congress Publication, New Delhi, Latest Edition
4. IRC 67 – 2001: Code of Practice for Road Signs, Indian Road Congress Publication, New Delhi
5. IRC 35 – 1997: Code of Practice for Road Markings, Indian Road Congress Publication, New Delhi
6. IRC 35 – 1997: Code of Practice for Road Markings, Indian Road Congress Publication, New Delhi

LIST OF EXPERIMENTS

I. Tests on Road Aggregates

- a. Aggregate Crushing value Test
- b. Aggregate Impact value Test
- c. Abrasion value Test a) Los Angeles b) Devel's
- d. Shape Tests (a) Flakiness Index (b) Elongation Index (c) Angularity Number
- e. Soundness Test
- f. Specific Gravity and Water Absorption
- g. Sieve Analysis a) Coarse Aggregate b) Fine Aggregate
- h. Film Stripping Test

II. Tests on Bitumen

- a. Penetration test
- b. Softening point test
- c. Ductility test
- d. Flash & Fire point test
- e. Specific gravity test

III. Tests on Bituminous Mixes

- a. Marshal Method of Bituminous Mix Design
- b. Bitumen Extraction Test

IV. CBR Test on Soil

V. Benkelman Beam Deflection Test

VI. Merlin Road Roughness Test