

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE332	TRANSPORTATION ENGINEERING LAB	0-0-3-1	2016

**Pre-requisite : CE308 Transportation Engineering - I**

**Course objectives:**

- To enable the students to conduct different tests to find various properties of aggregates, bitumen and soil subgrade and hence to assess their suitability in pavement construction.

**List of Experiments** (All experiments shall be conducted as per BIS/ASTM/AASHTO procedures)

I. Tests on aggregates

- Aggregate crushing value
- Aggregate impact value
- Los Angeles abrasion value
- Shape tests-Flakiness index and Elongation index
- Angularity of coarse aggregates and fine aggregates
- Specific gravity and water absorption of coarse aggregate
- Stripping value of road aggregates
- Dry Packing characteristics of aggregates (ASTM C29/ C29 M – 97)

II. Test on soil

- California Bearing Ratio test (*Soaked and Un-soaked CBR*)
- Dynamic cone penetration test (ASTM D6951 (2015) procedure)

III. Tests on bitumen

- Penetration value of bitumen
- Softening point of bitumen
- Ductility of bitumen
- Flash and Fire point of bitumen
- Measurement of mixing and compaction temperature of bitumen (Brookfield viscometer)  
(The test was previously written in the draft syllabus as Viscosity test on bitumen, but we have specified it)

IV. Test on bituminous mixes

- Determination of theoretical specific gravity of loose mix and bulk specific gravity of

*compacted mix (ASTM D2041, ASTM D1188)*

2. *Moisture sensitivity test of bituminous mixes (AASHTO T283 procedure)*

V. Functional evaluation of pavements

1. *Use of MERLIN apparatus to determine road roughness*

**Expected outcome:**

- The students will be able to assess the quality of various pavement materials and their suitability in highway construction.

**Reference books :**

1. L .R. Kadiyali, Principles and Practices of Highway Engineering, Khanna Publishers, 2009
2. MoRTH (2013) Specification for Road and bridge works (5<sup>th</sup> revision)
3. MS-2 manual (2015) Seventh edition, Asphalt Institute.
4. S. K. Khanna, C. E. G. Justo, A Veeraragavan, Highway Engineering, Khanna Publishers, 10e.

