Course Number and Name

BCE5L1 - CONSTRUCTION ENGINEERING LABORATORY

Credits and Contact Hours

2 & 45

Course Coordinator's Name

Ms.M.Hemapriya

Text Books and References

Course Description

- To learn the principles and procedures of testing Concrete and Highway materials and to get hands on experience by conducting the tests and evolving inferences.
- To know about the fresh mixed concrete and experience by mixing a freshly mixed concrete.

Prerequisites	Co-requisites
Basic Civil and Mechanical Engineering Practices Laboratory	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)

CO1	Have a fundamental knowledge of the basic test to be performed on the material used in the construction site
CO2	Testing the aggregate material which is used in the laying pavement
CO3	Designing the mix of the concrete for various structures in construction.
CO4	To know about the freshly mixed concrete and check their workability by slump, consistency and compaction.
CO5	To know the ability of the bitumen and their properties for laying pavements.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	H				M	M					
CO2					M						
CO3		M	M								
CO4	H			L	M						
CO5						M					

List of Topics Covered

UNIT I TESTS ON CEMENT **9**

Specific gravity, fineness, specific surface, soundness, consistency, initial and final setting time, compressive strength of cement mortar.

UNIT II TESTS ON AGGREGATES 12

a. Tests to find salinity, organic content etc.

b. Size distribution of particles.

c. Specific gravity / voids ratio.

d. Bulking of Sand.

Particle size, shape, flakiness index, elongation index, sieve analysis, specific gravity, density, absorption test, crushing and impact strength of coarse aggregates and abrasion tests.

UNIT III CONCRETE MIX DESIGN 6

UNIT IV TESTS ON FRESH AND HARDENED CONCRETE 12

Slump test, Vee-Bee Test, Compaction factor test, Test on cubes and cylinders – Determination of Young's modulus, compressive strength, tensile strength (beam and cylinder).

UNIT V HIGHWAY: TESTS ON BITUMINOUS MATERIALS AND MIXES 6

a. Penetration test on Bitumen

b. Ductility test on Bitumen

c. Softening point test on Bitumen or tar

d. Flash and fire point tests on bitumen cut back bitumen

e. Specific gravity test.

f. Viscosity test on black bitumen – cutback bitumen or tar (using orifice viscometer).

g. Marshall stability test on bituminous mix - preparation of bituminous mix and determination of density, voids, stability and flow values.