

TRANSPORTATION MATERIALS LABORATORY

VI Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACE110	Core	L	T	P	C	CIA	SEE	Total
		-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36			
<p>COURSE OBJECTIVES: The course should enable the students to:</p> <ol style="list-style-type: none"> I. Identify the properties and behavior of highway material for different loading patterns. II. Demonstrate tests on transportation materials like aggregate, bitumen, sand etc and check their Suitability. III. Understand the properties of cement by conducting setting time, specific gravity and compressive strength tests. IV. Measure and calculate flakiness and elongation properties of coarse aggregates. <p>COURSE OUTCOMES (Cos): CO 1: Understand material characteristics of coarse aggregates. CO 2: Understand material characteristics of bitumen specimens. CO 3: Remember the initial and final setting time of cement. CO 4: Remember the specific gravity and soundness of cement. CO 5: Analyze the compressive strength of cement.</p> <p>COURSE LEARNING OUTCOMES (CLOs): The students should enable to:</p> <ol style="list-style-type: none"> 1. Understand the technical terms and material characteristics for various pavement materials. 2. Evaluate the aggregate crushing strength of aggregates. 3. Evaluate the aggregate impact strength of aggregates. 4. Know the specific gravity and water absorption of coarse aggregates. 5. Evaluate the aggregate attrition strength value. 6. Evaluate the aggregate abrasion strength value. 7. Measurement of percentage of Flakiness and elongation of coarse aggregates. 8. Determine penetration valve of bitumen sample. 9. Determine ductility valve of bitumen sample. 10. Determine softening point valve of bitumen sample. 11. Determine flash and fire point valve of bitumen sample. 12. Evaluate normal consistency of fineness of cement. 13. Determine the initial and final setting time of cement. 14. Determine specific gravity and soundness of cement. 15. Evaluate compressive strength of cement. 16. Determine the bulking of sand sample. 								
LIST OF EXPERIMENTS								
Week-1	INTRODUCTION TO TRANSPORTATION MATERIALS LABORATORY – I							
Introduction to transportation material laboratory. Do's and Don'ts in materials lab.								

Week-2	AGGREGATE CRUSHING STRENGTH TEST
Measurement of Aggregate crushing test.	
Week-3	AGGREGATE IMPACT TEST
Measurement of Aggregate Impact test	
Week-4	SPECIFIC GRAVITY AND WATER ABSORPTION TEST
Calculation of specific gravity and water absorption test.	
Week-5	ATTRITION TEST OF COARSE AGGREGATES
Perform Attrition test of coarse aggregates.	
Week-6	ABRASION TEST OF COARSE AGGREGATES
Perform Abrasion test on coarse aggregates.	
Week-7	SHAPE TESTS OF COARSE AGGREGATES
Measurement of percentage of Flakiness in coarse aggregates. Measurement of percentage of Elongation in coarse aggregates	
Week-8	PENETRATION TEST OF BITUMINOUS MATERIALS
Find the Penetration value of bitumen sample.	
Week-9	DUCTILITY TEST OF BITUMINOUS MATERIALS
Find the Ductility value of bituminous materials.	
Week-10	SOFTENING POINT OF BITUMEN MATERIALS
Find the softening point value of bituminous materials.	
Week-11	FLASH AND FIRE POINT TEST OF BITUMEN MATERIALS
Find the flash point value of bitumen sample.	
Week-12	NORMAL CONSISTENCY OF FINENESS OF CEMENT
Perform test and find the normal consistency of fineness of cement.	
Week-13	INITIAL SETTING TIME AND FINAL SETTING TIME OF CEMENT
Find the initial setting time of cement. Find the final setting time of cement.	
Week-14	SPECIFIC GRAVITY AND SOUNDNESS OF CEMENT
Find the specific gravity of cement.	
Week-15	COMPRESSIVE STRENGTH OF CEMENT
Find the compressive strength of cement.	

Week-16	COMPRESSIVE STRENGTH OF CONCRETE
Find the compressive strength of concrete.	
Week-17	BULKING OF SAND
Find the bulking of sand sample	
Text Books:	
<ol style="list-style-type: none"> 1. Highway Engineering, "S.K.Khanna & C.E.G.Justo, Nemchand & Bros., 7th edition (2000). 2. Traffic Engineering & Transportation Planning – Dr.L.R.Kadyali, Khanna, 7th edition (2000). 	
Reference Books:	
<ol style="list-style-type: none"> 1. Principles of Traffic and Highway Engineering – Garber & Hoel, Cengage Learning. 2. Principles of Practices of Highway Engineering–Dr. L. R. Kadyali, and Dr. N. B Lal- Khanna 3. Highway Engineering – S. P. Bindra, DhanpatRai & Sons. – 4th Edition(1981) 	
Web References:	
<ol style="list-style-type: none"> 1. http://www.iare.ac.in 	