

## TRANSPORTATION ENGINEERING LABORATORY

VII Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACEB25	Core	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100
<b>Contact Classes: Nil</b>		<b>Tutorial Classes: Nil</b>		<b>Practical Classes: 36</b>			<b>Total Classes: 36</b>	
<b>I. COURSE OVERVIEW:</b>								
<p>Transportation engineering is the application of technology and scientific principles to the planning, design, operation and management of facilities. Traffic control refers to the traffic engineering, regulation, management and safety with an integrated approach in traffic system. This course gives an overview on Transportation engineering with respect to construction and maintenance of highways as per IRC standards. This course also focuses on designing new transportation systems and infra-structures, including highways. Further the course is useful to solve the complex problems related to the traffic management by collecting and evaluating the data such as traffic flow, density, speed and volume.</p>								
<b>II. OBJECTIVES:</b>								
<b>The course should enable the students to:</b>								
I The geometric design of highways and expressways based on different terrains.								
II The engineering properties of pavement materials used in construction of highway.								
III The various traffic surveys to implement traffic regulation and control measures.								
<b>III. COURSE OUTCOMES:</b>								
<b>After successful completion of the course, students should be able to:</b>								
CO1	Apply the fundamentals of highway engineering for effective planning and development of highways .						Apply	
CO2	Identify the mechanical properties of pavement construction materials for enhancing serviceability and durability of highway pavements.						Apply	
CO3	Analyze the factors affecting pavements deterioration and the remedial measures to enhance life time of rigid and flexible pavements.						Analyze	
CO4	Explain the stresses induced in rigid pavements considered for designing CC pavements to improve their Understand						Evaluate	
CO5	Design the flexible and rigid pavements as per IRC guidelines for enhancing serviceability and durability of expressways.						Create	
CO6	Choose the balancing techniques for effective balancing of Flexible and rigid pavements.						Create	
<b>LIST OF EXPERIMENTS</b>								
<b>Week – I</b>	<b>INTRODUCTION TO TRANSPORTATION LABORATORY – I</b>							
Introduction to transportation material laboratory. Do's and Don'ts in materials lab.								
<b>Week – 2</b>	<b>AGGREGATE CRUSHING STRENGTH TEST</b>							
Measurement of Aggregate crushing test.								
<b>Week – 3</b>	<b>AGGREGATE IMPACT TEST</b>							
Measurement of Aggregate Impact test								
<b>Week – 4</b>	<b>SPECIFIC GRAVITY AND WATER ABSORPTION TEST</b>							
Calculation of specific gravity and water absorption test.								
<b>Week – 5</b>	<b>ABRASION AND ATTRITION TEST OF COARSE AGGREGATES</b>							

To perform Abrasion and Attrition test of coarse aggregates.	
<b>Week – 6</b>	<b>SHAPE TESTS OF COARSE AGGREGATES</b>
Measurement of percentage of Flakiness in coarse aggregates. Measurement of percentage of Elongation in coarse aggregates	
<b>Week – 7</b>	<b>PENETRATION AND DUCTILITY TEST OF BITUMINOUS MATERIALS</b>
To find the Penetration and ductility value of bitumen sample.	
<b>Week – 8</b>	<b>SOFTENING POINT OF BITUMEN MATERIALS</b>
To find the softening point value of bituminous materials.	
<b>Week – 9</b>	<b>FLASH AND FIRE POINT TEST OF BITUMEN MATERIALS</b>
To find the flash point value of bitumen sample.	
<b>Week – 10</b>	<b>NORMAL CONSISTENCY OF FINENESS OF CEMENT</b>
To perform test and find the normal consistency of fineness of cement.	
<b>Week – 11</b>	<b>INITIAL SETTING TIME AND FINAL SETTING TIME OF CEMENT</b>
To find the initial and final setting time of cement.	
<b>Week – 12</b>	<b>SPECIFIC GRAVITY AND SOUNDNESS OF CEMENT</b>
To find the specific gravity and soundness of cement.	
<b>Week – 13</b>	<b>COMPRESSIVE STRENGTH OF CEMENT</b>
To find the compressive strength of cement.	
<b>Week – 14</b>	<b>BULKING OF FINE AGGREGATES</b>
To find the bulking of fine aggregates of sand .	
<b>Week – 15</b>	<b>STRUCTURAL EVALUATION OF PAVEMENT USING BENKELMAN BEAM DEFLECTION METHOD</b>
Structural evaluation of pavement surface by Benkelman beam deflection method	
<b>Text Books:</b>	
1. Khanna, S.K., Justo, C.E.G and Veeraragavan, A, “Highway Engineering”, Nem Chand & Bros, Revised 10 <sup>th</sup> Edition, 2017.	
2. Kadiyalai, L.R., “Traffic Engineering and Transport Planning”, Khanna Publishers, 2013.	
3. Partha Chakraborty, “Principles Of Transportation Engineering”, PHI Learning, 2017.	
<b>Reference Books:</b>	
1. Fred L. Mannering, Scott S. Washburn, Walter P. Kilareski, “Principles of Highway Engineering and Traffic Analysis”, John Wiley, 4 <sup>th</sup> Edition, 2007.	
2. Srinivasa Kumar, R, “Textbook of Highway Engineering”, Universities Press, 2011.	
3. Paul H. Wright and Karen K. Dixon, ‘Highway Engineering’, Wiley Student Edition, 7 <sup>th</sup> Edition, 2009.	