

## TRANSPORTATION ENGINEERING

VII Semester: CE																										
Course Code	Category	Hours / Week			Credits	Maximum Marks																				
ACEB23	CORE	L	T	P	C	CIA	SEE	Total																		
		3	-	-	3	30	70	100																		
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>																					
<p><b>I. COURSE OVERVIEW:</b>            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 infrastructures, 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> <p><b>II. OBJECTIVES:</b>  <b>The course should enable the students to:</b></p> <p>I The highway planning process, surveys involved in planning and highway alignment.</p> <p>II The geometric design of highways and expressways based on different terrains.</p> <p>III The various traffic surveys to implement traffic regulation and control measures.</p> <p>IV The engineering properties of pavement materials used in construction of highway.</p> <p><b>III. COURSE OUTCOMES:</b>  <b>After successful completion of the course, students should be able to:</b></p> <p>CO 1 <b>Recall the fundamentals of highway engineering for effective planning and development of highways based on the mission requirement.</b> Remember</p> <p>CO 2 <b>Identify highway intersection at urban areas for promoting continuous flow without congestions.</b> Apply</p> <p>CO 3 <b>Identify traffic signals at intersections for avoiding conflicts and promoting free flow of traffic.</b> Apply</p> <p>CO 4 <b>Classify the various traffic parameters considered in traffic study for regulating traffic at various controlled and uncontrolled intersections.</b> Analyze</p> <p>CO 5 <b>Explain the mechanical properties of pavement construction materials for enhancing serviceability and durability of highway pavements.</b> Understand</p> <p>CO 6 <b>Explain the stresses induced in rigid pavements considered for designing, CC pavements to improve their performance.</b> Understand</p> <p><b>IV. SYLLABUS:</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"><b>MODULE - I</b></td> <td style="width: 60%;"><b>HIGHWAY DEVELOPMENT AND PLANNING</b></td> <td style="width: 20%;"><b>Classes: 09</b></td> </tr> <tr> <td colspan="3">Classification of roads, road development in India, Current road projects in India, highway alignment, factors affecting alignment, Engineering surveys, drawing and reports, highway project.</td> </tr> <tr> <td><b>MODULE - II</b></td> <td><b>GEOMETRIC DESIGN OF HIGHWAYS</b></td> <td><b>Classes: 09</b></td> </tr> <tr> <td colspan="3">Introduction, highway cross section elements, sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance, design of horizontal alignment; design of vertical alignment; design of intersections.</td> </tr> <tr> <td><b>MODULE - III</b></td> <td><b>TRAFFIC ENGINEERING AND CONTROL</b></td> <td><b>Classes: 09</b></td> </tr> <tr> <td colspan="3">Traffic Characteristics, traffic engineering studies, traffic flow and capacity, traffic regulation and control. Design of parking facilities; highway lighting and Accident studies: causes and measures.</td> </tr> </table>									<b>MODULE - I</b>	<b>HIGHWAY DEVELOPMENT AND PLANNING</b>	<b>Classes: 09</b>	Classification of roads, road development in India, Current road projects in India, highway alignment, factors affecting alignment, Engineering surveys, drawing and reports, highway project.			<b>MODULE - II</b>	<b>GEOMETRIC DESIGN OF HIGHWAYS</b>	<b>Classes: 09</b>	Introduction, highway cross section elements, sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance, design of horizontal alignment; design of vertical alignment; design of intersections.			<b>MODULE - III</b>	<b>TRAFFIC ENGINEERING AND CONTROL</b>	<b>Classes: 09</b>	Traffic Characteristics, traffic engineering studies, traffic flow and capacity, traffic regulation and control. Design of parking facilities; highway lighting and Accident studies: causes and measures.		
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<b>MODULE - IV</b>	<b>PAVEMENT MATERIALS</b>	<b>Classes: 09</b>
Materials used in Highway Construction- Soils, Stone aggregates, bituminous binders, bituminous paving mixes; Portland cement and cement concrete: desirable properties, tests, requirements for different types of pavements,		
<b>MODULE - V</b>	<b>DESIGN OF PAVEMENTS</b>	<b>Classes: 09</b>
Introduction; flexible pavements, factors affecting design and performance; stresses in flexible pavements; design of flexible pavements as per IRC; rigid pavements- components and functions; factors affecting design and performance of CC pavements; stresses in rigid pavements; design of concrete pavements as per IRC; problems		
<b>Text Books:</b>		
<ol style="list-style-type: none"> <li>1. Khanna, S.K., Justo, C.E.G and Veeraragavan, A, 'Highway Engineering', Revised 10<sup>th</sup> Edition, Nem Chand &amp; Bros, 2017.</li> <li>2. Kadiyalai, L.R., 'Traffic Engineering and Transport Planning', Khanna Publishers, 2013.</li> <li>3. Partha Chakraborty, 'Principles Of Transportation Engineering', PHI Learning, 2017.</li> </ol>		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>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.</li> <li>2. Srinivasa Kumar, R, "Textbook of Highway Engineering", Universities Press, 2011.</li> <li>3. Paul H. Wright and Karen K. Dixon, "Highway Engineering", Wiley Student Edition, 7<sup>th</sup> Edition, 2009.</li> </ol>		
<b>Web References:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.nptelvideos.in/2012/11/introduction-to-transportation.html">http://www.nptelvideos.in/2012/11/introduction-to-transportation.html</a></li> <li>2. <a href="http://www.nptelvideos.com/civil_engineering/transportation_engineering_video_lectures.php">http://www.nptelvideos.com/civil_engineering/transportation_engineering_video_lectures.php</a></li> <li>3. <a href="https://nptel.ac.in/courses/105105107/">https://nptel.ac.in/courses/105105107/</a></li> <li>4. <a href="https://nptel.ac.in/courses/105101087/">https://nptel.ac.in/courses/105101087/</a></li> </ol>		
<b>E-Text Books:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://e-booksdirectory.com/details.php?ebook=5616">http://e-booksdirectory.com/details.php?ebook=5616</a></li> </ol>		