

TRANSPORTATION ENGINEERING

VI Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACE013	Core	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
Contact Classes: 45		Tutorial Classes: 15		Practical Classes: Nil			Total Classes:60	
<p>OBJECTIVES: The course should enable the students to:</p> <ol style="list-style-type: none"> I. Understand the importance of highway development of India and classification of roads and road patterns. II. Design various geometric elements like curves, gradients, super elevation etc. III. Capable of performing various traffic surveys. IV. Analyze traffic signals intersections and road markings and their designs. <p>COURSE OUTCOMES (COs):</p> <p>CO 1 Understand the importance of highway development of India and classification of roads and road patterns.</p> <p>CO 2 Design various geometric elements like curves, gradients, super elevation etc.</p> <p>CO 3 Capable of performing various traffic surveys and study basics of traffic engineering and regulations.</p> <p>CO 4 Analyze traffic signals intersections and road markings and their designs</p> <p>CO 5 Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.</p> <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> 1. Understand necessity for highway planning, different road development plans. Understand the different methods for deflection of beams with constant and variable moment of inertia. 2. Study Classification of roads, road network patterns, highway alignment. 3. Capable of performing various traffic surveys 4. Study factors affecting alignment, engineering surveys, drawing and reports, highway project. 5. Understand Importance of geometric design. 6. Analyze factors affecting highway geometric design. Design controls and criteria.. 7. Understand highway cross section elements including shoulder, kerb, carriageway, right of way. 8. Analyze sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance.. 9. Analyze design of horizontal alignment, design of super elevation and extra widening 10. Analyze design of transition curves, design of vertical alignment, gradients, vertical curves. 11. Study basics of traffic engineering and regulations 12. Predict basic parameters of traffic, volume, speed and density, traffic volume studies. 13. Evaluate thick cylinders and compound cylinders for necessary difference of radii under shrinkage and thick spherical shells. 14. Analyze Parking studies, on street and off street parking , road accidents , causes and preventive measures, accident. 15. Study road markings, need for road markings, types of road markings, design of traffic signals, Webster method. 								

<p>16. Understand types of Intersections, conflicts at intersections, requirements of at, grade intersection.</p> <p>17. Understand types of at grade intersections, canalization ,traffic islands, types of grade separated intersections, rotary intersection,</p> <p>18. Study concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.</p> <p>19. Understand Highway material characterization; sub-grade soil, stone aggregate.</p> <p>20. Explain construction of water bound macadam roads, construction of bituminous pavements.</p> <p>21. Study Surface dressing, bitumen bound macadam, bituminous concrete.</p> <p>22. Understand construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter.</p> <p>23. Analyze seal pavement failures, maintenance of highways.</p>		
UNIT-I	HIGHWAY DEVELOPMENT AND PLANNING:	Classes: 09
<p>Highway development in India, necessity for highway planning, different road development plans; Classification of roads, road network patterns, highway alignment, factors affecting alignment, engineering surveys, drawing and reports, highway project.</p>		
UNIT - II	HIGHWAY GEOMETRIC DESIGN:	Classes: 09
<p>Importance of geometric design, factors affecting highway geometric design. Design controls and criteria, highway cross section elements, sight distance elements, stopping sight distance, overtaking sight distance and intermediate sight distance, design of horizontal alignment, design of super elevation and extra widening, design of transition curves, design of vertical alignment, gradients, vertical curves</p>		
UNIT -III	TRAFFIC ENGINEERING AND REGULATIONS	Classes: 09
<p>Basic parameters of traffic, volume, speed and density, traffic volume studies, data collection and presentation, speed studies, data collection and presentation, origin and destinations studies. Parking studies, onstreet and offstreet parking , road accidents , causes and preventive measures, accident data recording, condition diagram and collision diagrams, traffic signs, types and specifications, road markings, need for road markings, types of road markings, design of traffic signals, webster method.</p>		
UNIT -IV	INTERSECTION DESIGN	Classes: 09
<p>Types of Intersections, conflicts at intersections, requirements of at-grade intersection, types of at grade intersections, canalization ,traffic islands, types of grade separated intersections, rotary intersection, concept of rotary, design factors of rotary, advantages and limitations of rotary intersections.</p>		
UNIT-V	HIGHWAY MATERIAL, CONSTRUCTION AND MAINTENANCE	Classes: 09
<p>Highway material characterization; subgrade soil, stone aggregate, bitumen materials, construction of gravel roads, construction of water bound macadam roads, construction of bituminous pavements: Surface dressing, bitumen bound macadam, bituminous concrete, construction of cement concrete pavements, construction of joints in cement concrete pavements joint filter and seal pavement failures, maintenance of highways, highway drainage..</p>		
Text Books:		
<p>1. Highway Engineering – S.K.Khanna&C.E.G.Justo, Nemchand& Bros., 7th edition(2000).</p> <p>2. Traffic Engineering & Transportation Planning – Dr.L.R.Kadyali,Khanna</p>		
Reference Books:		
<p>1. Principles of Traffic and Highway Engineering – Garber & Hoel, Cengage Learning.</p> <p>2. Principles of Practices of Highway Engineering–Dr.L.R.Kadyali, and Dr.N.B Lal- Khanna publications</p> <p>3. Highway Engineering – S.P.Bindra, Dhanpat Rai & Sons. – 4th Edition(1981)</p>		