

## DEPARTMENT OF CIVIL ENGINEERING

Course Outline for the Session February – June 2025-26 (Even Semester)

Faculty Name: RUDRESH A N

Subject with code: Transportation Engineering – BCV403

Semester with section: 4 - A

Modules	Class No	Topics proposed to be covered	Portion to be covered in %	Remarks
Module 1	1	Introduction, Different Modes of Transportation, M R Jayakar Committee recommendations	20.00	
	2	Road Classifications and Road Patterns. Factors affecting highway alignment		
	3	Engineering surveys for alignment conventional and modern methods		
	4	Factors affecting geometric design of roads, Cross Sectional Elements, Sight distances		
	5	Horizontal alignment- Transition curve, superelevation, Extra widening, Vertical alignment–gradients, summit and valley curves		
	6	Problems on Sight distance, Super elevation		
	7	Problems on, extra widening of curves, Length of transition curve		
	8	Problems on Length of summit and valley curve.		
Module 2	9	Desirable properties of aggregates, soil subgrade & Bitumen	40.00	
	10	Application of bituminous emulsion, Desirable properties of Bituminous Mixes		
	11	Factors Controlling design of highway pavements, Pavement types		
	12	Component parts of pavements and their functions		
	13	Types of joints used in rigid pavement. Critical stresses in flexible and rigid pavement		
	14	Significance and requirements, Surface drainage system and design-Examples		
	15	Sub surface drainage system, Types of cross drainage structures their choice and location.		
	16	Problems on design of Longitudinal drain.		
Module 3	17	Objectives and scope of Traffic Engineering, Road user characteristics	60.00	
	18	Vehicular characteristics – static and dynamic characteristics, Reaction time of driver and PIEV theory		
	19	Types of traffic engineering studies-volume, spot speed, speed and delay, parking, accident, origin & destination		
	20	objectives of studies and data collection, method of study, analysis		
	21	PCU concept, factors affecting and PCU at different locations and applications		

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	22	Traffic signs, Signal design by IRC method; Types of intersections.		
	23	Problems on Spot speed studies, Speed and delay studies		
	24	Problems on accident studies, Signal design by IRC method.		
<b>Module 4</b>	25	Permanent way and its requirements, Gauges and types	80.00	
	26	Typical cross sections single and double-line BG track		
	27	Coning of wheels and tilting of rails, Rails-Functions requirements		
	28	Types and defects of rails. Sleepers and Ballast: Functions, requirements		
	29	Track fitting and fasteners, Points & crossings		
	30	Railway Station and Yards. Metro train & high-speed train-Design factors considered.		
	31	Problem on Quantity calculation for laying railway track.		
	32	Problem on Super-elevation		
<b>Module 5</b>	33	Layout of an airport with component parts and functions, Site selection for airport	100.00	
	34	Aircraft characteristics affecting the design and planning of airport, Airport classification		
	35	Basic runway length-Corrections		
	36	Runway geometrics, Taxiway-Factors affecting the layout		
	37	Geometrics of taxiway-Comparison between Runway and Highway		
	38	Problems on Runway orientation		
	39	Problems on Basic Runway length		
	40	Problems on Exit taxiway design		

### List of Text Books

1. S K Khanna and C E G Justo, "Highway Engineering", Nem Chand Bros, Roorkee.
2. L R Kadiyali, "Highway Engineering", Khanna Publishers, New Delhi.
3. "A Text Book of Railway Engineering" by S C Saxena and S P Arora
4. "Airport Engineering" by S C Rangwala
5. "Airport Planning and Design" by Khanna Arora and Jain, Nem Chand Bros, Roorkee.
6. "Roads, Railways, Bridges, Tunnels and Harbour Dock Engineering by B L Gupta, Amit Gupta.
7. S K Khanna, C E G Justo and A Veeraragavan, "Highway Materials Testing Laboratory Manual", Nem Chand Bros, Roorkee.