

Lesson Plan for the Session Feb - May 2024-2025 (Even Sem)

Faculty Name: B h a r a t h i B

Subject with code: Transportation Engineering

Semester with section: 4th Sem

Module No	Class.	Topics proposed to be covered	% portion covered	Remarks
1		Introduction, Different Modes of Transportation	20	
		M R Jayakar Committee recommendations, Road Classifications and Road Patterns		
		Highway Alignment: Factors affecting highway alignment		
		Engineering surveys for alignment conventional and modern methods.		
		Highway Geometric Design: Factors affecting geometric design of roads		
		Cross Sectional Elements		
		Sight distances, super elevation, Extra widening,		
		Horizontal alignment- Transition curve, Vertical alignment- gradients, summit and valley curves		
2		Desirable properties of aggregates	40	
		soil subgrade & Bitumen,		
		Application of bituminous emulsion, Desirable properties of Bituminous Mixes		
		Pavement Design: Factors Controlling design of highway pavements		
		Pavement types, component parts of pavements and their functions		
		types of joints used in rigid pavement. Critical stresses in flexible and rigid pavement.		
		Significance and requirements, Surface drainage system and design		
		sub surface drainage system, Types of cross drainage structures their choice and location.		
3		Objectives and scope of Traffic Engineering. traffic Characteristics: Road user characteristics, vehicular characteristics	60	
		static and dynamic characteristics,		
		Reaction time of driver and PIEV theory,		
		Types of traffic engineering studies- volume, spot speed,		
		speed and delay, parking, accident, origin & destination		
		objectives of studies and data collection, method of study, analysis.		
		PCU concept, factors affecting and PCU at different locations and applications		
		Traffic signs, Signal design by IRC method; Types of intersections.		

4		Permanent way and its requirements, Gauges and types, Typical cross sections single and double-line BG track	80	
		Coning of wheels and tilting of rails		
		Rails-Functions requirements		
		types and defects of rails. Sleepers and Ballast: Functions, requirements		
		Track fitting and fasteners, Calculation of quantity of materials required for laying a track		
		Points & crossings, Railway Station and Yards		
		Metro train & high speed train- Design factors considered		
5		Layout of an airport with component parts and functions	100	
		Site selection for airport,		
		Aircraft characteristics affecting the design and planning of airport		
		Airport classification, Runway orientation using wind rose with examples		
		Basic runway length-Corrections and examples		
		Runway geometrics, Taxiway-Factors affecting the layout		
		geometrics of taxiway-Comparison between Runway and Highway		
		Design of exit taxiway with examples.		

Suggested Learning Resources

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.

Web links and Video Lectures (e-Resources):

1. <https://nptel.ac.in/courses/105101087>
2. https://onlinemanuals.txdot.gov/txdotmanuals/rdw/horizontal_alignment.htm#BGBHGECC
3. www.civil.iitb.ac.in/tvm/1111_nptel/567_Grade/plain/plain.html
4. <https://www.pavementinteractive.org/>
5. <https://www.eng.auburn.edu/research/centers/ncat/research/other-publications.html>
6. <https://nptel.ac.in/courses/105/106/105106203/>
7. <https://nptel.ac.in/courses/105/101/105101008>
8. <https://nptel.ac.in/courses/105/104/105104098>
9. <https://www.classcentral.com/course/edx-intro-to-traffic-flow-modeling-andintelligenttransport-systems-12728>
10. <https://www.aai.aero/>
11. <https://www.faa.gov/>
12. <https://www.icao.int>