B. Tech. Engineering				
Course code: Course Title	**Course Structure**			**Pre-Requisite**
CE305: Transportation Engineering	**L**	**T**	**P**	**NIL**
	3	**0**	**2**	

Course Objective: This course aims to expose the civil engineering students to various fields of transportation engineering including material testing and quality control in highway projects. This course will deal with various aspects of planning, designing, construction and maintenance of the highways, railways, airports, tunnels, harbours and docks.

S. No	Course Outcomes (CO)
CO1	To expose students to carry out various traffic studies and experiment of the properties of highway materials
CO2	To expose students to the elements of design of highway geometry and highway pavements
CO3	To expose students to geometric design of railway track, concept of points and crossings, signals and track maintenance
CO4	To expose students to airport planning and design of runway, taxiway and various navigational aids
CO5	To expose students to the basic features of planning and design of tunnels and harbours

S. No	Contents	Contact Hours
UNIT 1	**Introduction:** Role of Transportation, Modes of Transportation, their importance and limitations, Planning and Engineering surveys, Basic requirements of alignment, Controlling factors for alignment.	6
UNIT 2	**Highways**: Geometric design elements of highways, highway materials, highway construction, highway pavements, traffic studies, traffic control devices, highway drainage and maintenance.	10
UNIT 3	**Railways:** Elements of Permanent way, wear and creep of rails, geometric design, track resistance and tractive power, points and crossings, design of turnout, stations and yards, signaling and interlocking, modernization of railway tracks.	10
UNIT 4	**Airports:** Classification of airports, obstruction and zoning laws, typical layout of airport, design of runway, design of taxiway, marking and lighting.	8
UNIT 5	**Tunnel, Harbour and Docks:** Types of tunneling, methods of tunneling, classification of harbours, breakwaters and types of docks.	8
	Total	**42**

REFERENCES

S.No.	Name of Books/ Authors/ Publishers	Year of Publication / Reprint
1	Khanna, S. K., Justo, C.E.G. and Veeraragavan A. “Highway Engineering”, Nem Chand & Bros., Roorkee.	2014
2	Kadiyali, L. R., “Traffic Engineering and Transportation Planning”, Khanna Publishers, New Delhi.	2018
3	Saxena, S. C. and Arora, S. P., “A Text Book of Railway Engineering”, Dhanpat Rai & Sons, Delhi.	2003
4	Khanna S.K., Arora M.G. and Jain S.S., “Airport Planning and Design” Nem Chand & Bros., Roorkee.	2022
5	Srinivasan R., “Harbour, Dock and Tunnel Engineering” Charotar Publishing House Anand, Gujarat.	2016
6	Khanna, S. K., Justo, C.E.G. and Veeraragavan A. “Highway Materials and Pavement Testing”, Nem Chand & Bros., Roorkee.	2013