PE/CE/19-T **Transportation Engineering** **Semester: 7th**

Week	Lecture 1	Lecture 2	Lecture 3
	Content		
Week 1	**Introduction to Road Transportation**. History of road development in India and abroad (Roman, Tresaguet, Telford, and Macadam constructions).	Road patterns and classification of roads. Objectives of highway planning.	Planning surveys and the Saturation system of planning.
Week 2	**Cross Section Elements**: friction, carriageway, and formation width.	Land width, camber, and IRC recommended values.	Types of terrain and design speed.
Week 3	Sight distance: stopping sight distance (SSD) and overtaking sight distance (OSD).	Overtaking zones and intermediate sight distance (ISD).	Sight distance at intersections and headlight sight distance. Critical locations for sight distance.
Week 4	**Introduction to Rail transportation** and its importance in India.	**Permanent way**: requirements and components. Gauges in India and abroad; selection of gauge.	Coning of wheels and adzing of sleepers.
Week 5	Rails: functions, composition of rail steel, and types of rail sections.	Requirements of an ideal rail section and length of rails. Defects in rails and creep of rails.	Long welded rails and continuously welded rails.
Week 6	**Sleepers**: functions and requirements of an ideal sleeper.	Types of sleepers: wooden, cast iron, steel, and concrete; their advantages, disadvantages, and suitability.	Sleeper density. Fastenings for various sleepers (fish plates, spikes, bolts, etc.). Elastic fastenings.
Week 7	**Sessional Exam 1**		
Week 8	Ballast: functions, requirements, types of ballast and their suitability.	**Introduction to Airport Planning**: Air transportation, its importance and characteristics in India.	Layout plan of an airport and its basic elements (terminal area, apron, taxiway).
Week 9	Basic elements: runway and hanger. Aircraft characteristics and their effect on airport elements.	Site selection of an airport and classification of airports.	**Runway Layout and Pavement Design**: Runway orientation and Wind Rose diagram.
Week 10	Basic runway length and corrections to basic runway length.	Runway patterns. Difference between highway and runway pavement.	Types of runway pavements and design factors for runway pavement.
Week 11	Brief introduction to the design of thickness of a runway pavement.	**Tunnels**: sections of tunnels, their advantages, limitations, and suitability.	Shaft and pilot tunnel. Driving tunnels in rocks: sequence of construction operations and the full face method.
Week 12	Heading and bench method; drift method	Driving tunnels in soft ground: sequence of construction	Needle Beam Method
Week 13	Shield tunneling and compressed air tunneling	**Docks and Harbour Engineering**: definition of basic terms (Harbour, Port, Satellite Port, Docks, Waves, and Tides).	Planning and design of Harbours: Harbour layout and terminal facilities.
Week 14	**Sessional Exam 2**		
Week 15	Planning and design of Harbours: Harbour layout and terminal facilities.	Coastal structures: Piers, Breakwaters, and wharves	Jetties, Quays, spring fenders, dolphins, and floating landing stage