Major Elective – 2
(Group – 4)
Transportation Facility Design

Course Objectives:

1. To make the students conversant with the design aspects of transportation facilities required for the users.
2. To provide knowledge of design standards of transportation facilities along with aesthetic and safety aspects.

Course Contents:

1. Introduction: Design of highways, design of at-grade intersections, design of signalized intersection, design of grade separated intersection, terminal design, and design of facilities for non-motorised transport.
2. Terminal Planning & Design: Terminal functions, analysis of terminals, process flow charts of passenger & goods terminals, terminal processing time, waiting time, capacity & level of service concept, study of typical facilities of highway, transit, airport and waterway terminals, concept of inland port.
3. Design of Highways: Hierarchy of highway system, functions, design designations, concepts in horizontal & vertical alignment, integration, optical design, geometrical standards for mobility & accessibility components, landscaping and safety considerations, evaluation and design of existing geometrics.
4. Design of Intersections: Review of design of at-grade intersections, signal coordination – graphic methods & computer techniques, grade separated intersections – warrants for selection, different types & geometric standards, spacing & space controls, ramps & gore area design.

Tutorials:

1. Problems based on design of at-grade intersections, signalized intersection.
2. Problems based on design of grade separated intersections.
3. Problems based on design of facilities required for non-motorised transport and pedestrians.
4. Problems based on design of terminals for passenger and goods on highway, railway, airport and waterway port.
5. Problems based on design of horizontal and vertical alignment of highways with landscaping and safety aspects.

Field Visit:

Visit to grade-separated intersections, full-cloverleaf junction.
Visit to bus, railway, airport, waterway port terminal area.

References:

1. Kadiyali, L.R., *Traffic Engineering and Transport Planning*, Khanna publishers.
2. IRC-SP41: *Guidelines for the Design of At-Grade Intersections in Rural & Urban Areas*
3. Salter, R J., *Highway Traffic Analysis and Design*, ELBS.
4. Edward K. Morlock, *Introduction to Transportation Engineering & Planning, International Student Edition*, Mc-Graw Hill Book Company, New York.

5. Khanna S.K., Arora M.G., Jain S.S., *Airport Planning & Design*, Nemchand Bros., Roorkee
6. Horenjeff Robert, *The planning & Design of Airports*, McGraw Hill Book Co.
7. Saxena S.C., *Railway Engineering*, Dhanpat Rai & Sons, 1995.
8. Vukan R. Vuchic, *Urban Transit : Operations, Planning and Economics*, Wiley Sons Publishers.
9. Bindra S.P., *Docks & Harbour Engineering*, Dhanpat Rai Publications,
10. Srinivasan R., Harbours, *Docks & Tunnel Engineering*, Charotar Publishing House, Anand, 1999.