Inter Disciplinary - 1
Basics of Transportation Engineering

Couse Objectives:

1. To provide the basic understanding of Transportation Engineering and its main divisions.
2. To make the students aware of techniques used in transportation planning, traffic flow management, pavement – design, construction and its maintenance.

Course Contents:

1. Introduction: Importance of transportation, various modes and their suitability.
2. Urban transportation systems planning: Public, private, para-transit systems, coordination, routing, scheduling, fare structure.
3. Travel demand modeling: Land use planning, trip generation, trip distribution, modal split, trip assignment, their analysis.
4. Traffic Engineering: Basic elements-user, facility, vehicles, environment. Their characteristics and inter actions, traffic flow, classified volume, PCU concept, speed-flow-density relationship, headway, travel time and delay measurement techniques, O-D survey, accident analysis.
5. Traffic Infrastructures: Highway geometric elements, curves, intersections, rotary, grade-separated intersections, markings, signs, signals, parking, bus stops, terminal area, truck terminals.
6. Railway, Air port and Docks-Harbour: Their planning at the regional context, important characteristics, cargo and passenger demand forecasting, planning and design of terminal area facilities.
7. Pavements: Types, materials, tests, design criteria, ESWL, EWLF, CBR method, Marshall stability test, C.C. pavement design, joints, Construction methods for flexible and rigid pavements, failures, evaluation study, Benkelman beam deflection study, unevenness measurement, design of overlays, maintenance management.
8. Economic evaluation and Environmental Impact Assessment procedures for transportation projects.

References:

1. B.G.Hutchinson, *Principles of urban transportation system planning*- McGraw-Hill, New York, 1974
2. Edward K.Morlok, *Transportation Engg. and Planning*
3. W.Dickey, *Metropolitan Transportation Planning* Tata McGraw-Hill, New Delhi, 1975
4. Blunder and Black, *Land useTtransportation System*
5. J.Ortuzer and L.G. Willumsen, *Modelling Transport,* Johan Wiley and Sons Chincester,1994
6. Vukan R. Vuchic, *Urban Transit : Operations, Planning and Economics*, Wiley Sons Publishers.
7. Peter White, *Public Transport*, UCL Press
8. Kadiyali L.R., *Traffic Engineering and Transport Planning*, Khanna Publishers
9. Khisty, C J., *Transportation Engineering – An Introduction*, Prentice-Hall, NJ
10. TCRP Report 30, TCRP Report 95, TCRP Report 100
11. S.C. Saxena, *Traffic Planning and Design,* Dhanpat Rai Pub., New Delhi.
12. Partho Chakraborty and Animesh Das, *Principles of Transportation Engineering*, PHI

13. C. S. Papacostas, *Fundamentals of Transportation System Analysis,* PHI.
14. James H. Banks, *Introduction to Transportation Engineering,* WCB-McGraw Hill, New York
15. L.J.Pingnataro, *Traffic Engineering; Theory and Practice*. Prentice Hall, Englewood Clitts, 1973.
16. M.Wohl and B.V.Martin, *Traffic System Analysis for Engineering and Planners*, McGraw-Hill. New York,1983.
17. D.R.Drew, *Traffic Flow Theory and Control*, McGraw Hill. New York 1968.
18. W.R.McShane, R.P.Roess and E.S.Prassas, *Traffic Engineering*, Prentice Hall, New Jersey, 1990.
19. R.J.Salter, *Highway Traffic Analysis and Design*, McMillan, Hampshire, 1989.
20. *Highway Capacity Manual*, Transportation Research Board, Washington D.C., 1997, 2000
21. Kadiyali L.R.and Lal, N. B., *Principles & Practice of Highway Engineering*, Khanna Publishers, Delhi.
22. Khanna S.K., Justo C.E.G., *Highway Engineering*, Nem Chand & Bros., Roorkee.
23. Khanna S.K., Arora M.G., Jain S.S., *Airport Planning & Design*, Nemchand Bros., Roorkee
24. Horenjeff Robert, *The planning & Design of Airports*, McGraw Hill Book Co.
25. Saxena S.C., *Railway Engineering*, Dhanpat Rai & Sons, 1995.
26. Bindra S.P., *Docks & Harbour Engineering*, Dhanpat Rai Publications,
27. Srinivasan R., Harbours, *Docks & Tunnel Engineering*, Charotar Publishing House, Anand, 1999.