Traffic Engineering and Safety

Course Code	Credit Hours
CE- 447	3-0

Course Description

This course comprises of a basic introduction to traffic engineering principals and traffic flow theory, roadway features that pertains to the safety of roadway infrastructure users. This course includes the human and vehicle behaviour, queuing disciplines, shockwave anatomy, design and analysis of traffic controlling mechanisms for   intersections, interchanges, and roadway segments.

Text Book:

Traffic Engineering, Roess, R., McShane, W., and Prassas, E., Prentice-Hall, Englewood Cliffs, New Jersey, 1998.

Reference Book:

1.   Highway Engineering by Oglesby and Hicks. 4th Edition.

2.   Principles of Highway Engineering and Traffic Analysis by Fred L. Mannering, Walter P. Kilareski, Scott S. Washburn, 3rd Edition.

3.   Transportation Engineering and Planning, Papacostas, C. S. and Prevedouros, P.D., Prentice-Hall, Englewood Cliffs, New Jersey, Third Edition (2004).

4.   Transportation Engineering - An Introduction, Khisty, C.J. and Lall, B.K, Prentice Hall, Englewood Cliffs, New Jersey, 1998.

5.   Highway Capacity Manual (HCM 2000)

Prerequisites :

CE 242 Transportation Engineering–II

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	Introduction to Transportation Systems/ Traffic Engineering and Basic Definitions. Roadway Users/ Human factors and Vehicle Characteristics
2-3	Traffic Related Design Aspects, Traffic Control Devices, Traffic Stream Characteristics/ Greenshields Equations
4-5	Shock Wave Theory, Applications of Shock waves
6-7	Statistical Applications in Traffic Engineering, Surveys, Traffic Studies and Analysis: Travel Time and Delay Studies
8	Freeway capacity analysis, Ramp and Ramp Junctions, Planning and Operational analysis
9	**Mid Semester Exam**
10	Queuing theory, Applications and analysis
11-12	Basic concepts of traffic signals, Signal phasing, Capacity of traffic signals, Signal timing
13	Delays at isolated traffic signals and coordinated traffic signals
14	Safety consideration in highway design, Traffic safety - crash data analysis, Traffic conflicts technique
15	Introduction to ITS, Traffic Engineering Software, Application of AI in Data Collection & Vehicle Detection
16	Use of software for Traffic analysis (Synchro / HCS2000)
17-18	End Semester Exam

Practical: Nil.