

Traffic Engineering

Code CE 865	Credit Hours 3-0
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Course Description

Traffic congestion is becoming a part of our daily life and a major concern for governments and citizens. This course describes the main traffic concepts and its principles. It also introduces the traffic flow theory, describing the three main components (flow, speed, and density), capacity analysis for highways and signalized intersections, design of signal timing, and evaluation methodology. It also introduces traffic network simulation models for traffic modeling, evaluation, and assessment of the effectiveness of design alternatives

Text Book:

1. Traffic Engineering, Fourth Edition by R.P. Roess, E.S. Prassas, and W.R. Mc-Shane

Reference Book:

1. Papacostas, C. S. and Prevedouros, P.D. Transportation Engineering and Planning, Prentice-Hall, Englewood Cliffs, New Jersey, Third Edition (2004).
2. Roess, R., McShane, W., and Prassas, E., Traffic Engineering, Prentice-Hall, Englewood Cliffs, New Jersey, 1998.
3. Mannering, F. L., Kilareski, W. P., and Washburn, S. S. Principles of Highway and Traffic Analysis, John Wiley & Sons Inc. New Jersey, Third Edition (2004).
4. Khisty, C.J. and Lall, B.K, Transportation Engineering - An Introduction, Prentice Hall, Englewood Cliffs, New Jersey, 1998.

Prerequisites:

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10 -15 %
Assignments	5 -10 %
Mid Terms	25%
ESE	40 - 50%
Term Project	10%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction to Traffic Engineering	Course Outline, Course Objectives, Teaching Plan, Grading Policy Introduction to Traffic Engineering Background and Definitions
2	Road User & Vehicle Characteristics	Drivers Characteristics Vehicle Characteristics
3	Roadway Design and Operations	Human Factor Introduction to Geometric Design
4	Traffic Control Devices	Traffic Markings Traffic Signs Traffic Signals
5-6	Traffic Stream Characteristics	Type of Facilities Traffic Flow Parameters Relationship among parameters/Greenshields Equations Shockwave Theory and its Application
7-8	Traffic Studies	Statistical Applications in Traffic Engineering Volume Studies and Characteristics Advanced Data Collection Techniques & Application of AI in Big Data and Traffic Engineering Travel Time and Delay Studies
9	MID-SEMESTER EXAM	

10	Accident & Parking Studies	Accident Data Collection and Analysis Parking Surveys and Analysis
11	Capacity Analysis	Concept of LOS Capacity Analysis of Multilane Highways Capacity Analysis of Motorways
12	Introduction to Queuing Theory	Queuing Process and Disciplines Measures of Queue Performance
13-14	Application of Urban and Suburban Street Systems	Introduction to Intersection Control Basic Principles of Intersection Signalization Fundamentals of Signal Timing Introduction to Intersection and Signal Design Types of Signals
15-16	Analysis of Signalized Intersections	Introduction to Highway Capacity Manual (HCM) Basic Models Signal Timing Design Capacity Analysis Synchro, HCS, and VISSIM Software Introduction
17	Traffic Safety & Analysis	Traffic Safety Consideration on Highways Crash Data Analysis Traffic Conflict Techniques Term Project Presentations
18	END SEMESTER EXAM	