TRAFFIC FLOW PRINCIPLES FOR PRACTITIONERS (TE-27)

COURSE OVERVIEW

The course will focus primarily on the “link and node” level of traffic systems. It will explore three themes for designing, evaluating, and controlling traffic systems:

1. Basic Assessment Tools (time-space & queuing diagrams)
2. Flow Theory (fundamental diagrams & dynamic models)
3. Applications (using the above ideas to solve problems involving traffic signals, freeway systems, and street networks)

COURSE OUTLINE

DAY 1

Chapter 1 Introduction

Chapter 2 Vehicle Trajectories
   a. Time-space diagrams: graphical tool for displaying data about vehicle motion
   b. Definitions of traffic stream properties

Chapter 3 Links (e.g., road segments)
   a. Fundamental diagrams: flow-density relations
   b. Link dynamics: Kinematic Wave (KW) theory

DAY 2

Chapter 3 Links (cont.)

Chapter 4 Nodes (e.g., intersections, terminals, etc.)
   a. Queuing diagrams
   b. Delay and queue length at bottlenecks

DAY 3

Chapter 5 Applications
   a. Traffic signals (timing, vehicle delay, arterials)
   b. Freeway management (on-ramp metering)
   c. Simple networks and complications due to route choice