Traffic Flow Theory and Control (20552)

1. Fundamentals of traffic flow
   Speed, volume, density measurements
   Speed, density, flow relationships

2. Traffic flow characteristics
   Flow characteristics
   Speed characteristics
   Density characteristics

3. Statistical distribution of traffic flow parameters
   Counting and interval distributions
   Headway distribution
   Speed distribution models
   Gap acceptance distributions

4. Traffic stream models
   Speed-density models
   Speed-flow models
   Density-flow models

5. Car following models
   Linear car following models
   Traffic stability
   Non-linear car following models
   From car following to traffic stream models
   Acceleration noise

6. Continuum flow models
   Simple continuum models
   High order continuum models

7. Shock wave Analysis
   Shock wave at intersections
   Shock wave along a highway

8. Queuing analysis
   Queuing systems
   Queuing models for intersections
   Queuing models for roadways

9. Traffic flow models for intersections
   Unsignalized intersection models
   Signalized intersections models

TEXTS:

Required:

Traffic Flow Theory: Characteristics, Experimental Methods, and Numerical Techniques. Diheng Ni, 1st Edition, 2015.

Recommended:

1. FHWA's Traffic Flow Theory a State of the Art Report, 2001.
2. Transportation Research Board, "Monograph on Traffic Flow Theory", 1975.
3. Fundamentals of Transportation and Traffic Operations, C.F. Daganzo, 1997.
   May, A. D. "Traffic Flow Fundamentals", 1990. (M