



## Course Outline of Traffic Management and control

### Introduction:

This course will introduce the student Introduction To Traffic Engineering; Theories Of Traffic Flow; Queuing Theory, Capacity And Delay Analysis Of Roundabout And Signalized And Unsignalized Intersections; Signal Timing Plans Control And Optimization Of Isolated Intersection And Road Network; Traffic Simulation; Case Studies; SIDRA, TRANSYT-7F, And SINCRO Software Applications.

### Objectives :

The objectives of this course are:

- To introduce the fundamental concepts and basic components of a traffic system,
- To investigate traffic characteristics
- To conduct traffic studies, including traffic flow, volume, speed, queue, and delay studies.
- To learn how prepare transport planning

<b>Topics</b>
<b>I. General Introduction</b>
Definitions of Transportation Engineering and its Divisions, History of Transportation, Urban Road Systems, Highway System Classification, Types of Transportation Facilities.
<b>II. Traffic Engineering Studies</b>
Volume Studies ,Traffic Counts, travel Time and Delay Studies, Spot Speed Studies, Capacity and Level of Service for Highway Segments.
<b>III. Traffic Stream Characteristics</b>
Traffic Flow Theory, Time Space diagram, Variables of Interest, Primary Elements of Traffic Flow, Flow Speed Density, Fundamental Diagram of Traffic Flow, Mathematical Relationships Describing Traffic Flow
<b>IV. Parking Studies</b>
Types of Parking Facilities, Definitions of Parking Terms, Methodology of Parking Studies, Analysis of Parking Data, Parking control systems.
<b>V. Traffic Control and Management</b>
Objectives , Demand management, Engineering measures, Junction types(Uncontrolled non-priority junctions, Priority junctions, Roundabouts, Traffic signals, Grade separation), Road markings, Traffic Signs.



<u>Topics</u>
<b>VI. Road Safety Engineering</b>
Factors resulting in accidents , Road accident definition, Road Accidents in Palestine, Issues Involved in Transportation Safety, Causes of collisions , Road Safety & Traffic Management, Methods of Summarizing Crash Data, Identifying and Prioritizing Hazardous Locations and Elements, Designing road safety engineering measures.
<b>VII. Traffic Calming</b>
Why traffic calming, Traffic calming, how, Techniques Design Criteria, The Process, Traffic calming techniques.
<b>VIII. Public Transport Priority</b>
Design objectives, Bus priority measures, Bus lanes and busways, Traffic and parking management measures, Traffic signal control, Bus stop improvements, The process of designing and evaluating bus priority measures.
<b>IX. The Transportation Planning Process</b>
Situation definition, Problem definition, Search for solutions, Analysis of performance, Evaluation of alternative, Choice of project, Specification and construction.
<b>X. Development Process and Sustainable Development</b>
Planning context, The role of the transport engineer, Traffic Impact Assessment/Transport Assessment, Accessibility planning using ACCESSION, Environmental assessment, Sustainable development.
<b>XI. Intelligent Transport Systems</b>
Introduction, Using ITS, Public transport travel information and ticketing, Vehicle safety, System integration.
<b>XII. Case Studies and Computer Application</b>
SIDRA (isolated intersection), TRANSYT7F, SINCRO Package, TRANSCAD, PARKCAD.

**Presentation Methodology:**

Lectures using LCD , discussion classes, Laboratory Works, projects.

**Laboratory Works and Participations**

**Projects:** The students will divided into groups and Every group will work on subject of the following:

- **SIDRA** (isolated intersection), Analysis of all types of isolated intersections, Design of all types of isolated intersections.



- **TRANSYT7F**(Analysis and optimize of isolated signalized intersection, Analysis and optimize of network signalized intersections)
- **SINCRO Package** (Micro Simulation of Network, Analysis and optimize of network signalized intersections,
- **TRANSCAD,**
- **PARKCAD.**

### Grading Policy:

- Assignment and Projects 45 %
- Presentation & Participations 10 %
- Final Exam 45 %

### References :

1. Gartner, N. H., Messer, C. J., and Rathi, A., **TRAFFIC FLOW THEORY: A State-of-the-Art Report, The Turner-Fairbank Highway Research Center, FHWA, U.S. Department of Transportation, Washington, D.C., 2010.**
2. (<http://www.tfhrc.gov/its/tft/tft.htm>) or <http://www.fhwa.dot.gov/research/>
3. National Research Council, Highway Capacity Manual, Transportation Research Board, Washington, D.C, 2000.
4. Slinn, M., P. Matthews & P. Guest, Traffic Engineering Design, Principals and Practice, Arnold, London 1998
5. O'Flaherty, C.A., Transport Planning & Traffic Engineering, Oxford, Butterworth Heinemann, 1997.