

<b>Department of Civil Engineering</b>				
<b>Special Topics in Traffic Engineering (61564)</b>				
<b>Total Credits</b>	<b>3</b>			
<b>major elective</b>				
<b>Prerequisites</b>	P1 : Transportation Systems Eng'g II (61460) OR Transportation Systems Engineering II (61463)			
<b>Course Contents</b>				
Advanced topics of interest to students related to traffic engineering and its computer applications.				
<b>Intended Learning Outcomes (ILO's)</b>			<b>Student Outcomes (SO's)</b>	<b>Contribution</b>
1	an ability to apply knowledge of mathematics, science, and engineering in the human, vehicle and transportation environment characteristics and highway geometrics.		A	10 %
2	an ability to conduct safety studies as well as to utilize ITS technologies to collect the necessary data for such studies		B G K	30 %
3	a clear image of the role of ITS in the operation and management of advanced transportation systems. An ability to identify the proper surveillance systems depending on the planned objective function. An ability to estimate accident rates at different road elements considering road geometry and the presence of other road users such as pedestrians		C F G H	35 %
4	an ability to identify and formulate traffic safety problems and to provide reasonable and feasible solutions. Moreover to identify the sites with major safety problems for improvement prioritization.		E J	25 %
<b>Textbook and/ or References</b>				
1. ITS Handbook 2000, Recommendation from the World Road Association (PIARC). By: PIARC Committee on Intelligent Transport, 2000. 2. Traffic Control Systems Handbook. By FHWA, 2005. 3. Traffic and Highway Engineering, 4th edition. By: N. Garber, and Hoel. L., CI-Engineering Publisher, 2010. 4. Highway Safety Manual. By: AASHTO, 2010. 5. Highway Safety Design and Operations Guide. By: AASHTO, 1997. 6. Road Management for Development, 2nd edition. By: Richard Robinson and Bent Thagesen. Taylor and Francis e-Library, 2004. 7. Transit Signal Priority TSP: A Planning and Implementation Handbook. By: Harriet R. Smith, Brendon Hemily and Miomir Ivanovic, 2005.				
<b>Assessment Criteria</b>			<b>Percent (%)</b>	
First Exam			20 %	
Second Exam			20 %	
Projects			10 %	
Final Exam			50 %	
<b>Course Plan</b>				
<b>Week</b>	<b>Topic</b>			
1-4	1. Emerging Issues and Trends ITS 1.1 Introduction to Traffic Issues and Challenges 1.2 Definition of ITS and Application Areas 1.3 ITS Architecture 1.4 Surveillance Systems 1.5 Examples of ITS in Traffic Management			
5-8	2. Traffic Safety 2.1 Issues involved in Traffic Safety 2.2 Analysis of Crash Data 2.3 Identifying Hazardous Locations and Elements 2.4 Traffic Safety and Road Design			

	Elements
9 &10	3. Traffic Conflict Technique TCT 3.1 Definitions 3.2 Safety Indices 3.3 Macro and Micro simulations
11 &12	4. Accident Predictive method for Rural Two-Lane, Two-Way Roads 4.1 Introduction to Highway Safety Manual HSM 4.2 Definitions 4.3 Predictive Models for Rural Two-Lane, Two-Way Roadway Segments and Urban Intersections 4.4 Crash Modification Factors 4.5 Method Limitations and applications
13, 14, 15	5. Accident Predictive Method for Urban and Suburban Arterials 5.1 Definitions 5.2 Predictive Models Considering Pedestrians and Bicycles involved accidents 5.3 Crash Modification Factors 5.4 Method Limitations and applications