## THE PENNSYLVANIA STATE UNIVERSITY Department of Civil and Environmental Engineering CE 423 Traffic Operations Fall 2002

## **COURSE DESCRIPTION**

## **Course Objectives**

- To understand the significance and role of highway capacity and traffic operational analyses in planning, designing and maintaining the highway network.
- To learn the basic principles of traffic engineering and operations.
- To learn and use the capacity analysis procedures, and become familiar with the Highway Capacity Manual and the Highway Capacity Software.
- To apply traffic engineering principles in a traffic impact study.

## **Schedule of Topics, Readings and Laboratory Exercises**

<u>Date</u>	Assigned Reading	<u>Topic</u>	Laboratory Exercise
Aug. 27 T	HCM Ch. 1, 2	Introduction to Traffic Engineering and the Highway Capacity Manual	Traffic Impact Studies – General Information
Aug. 29 Th	TE Ch. 3	Capacity and LOS - Definitions	
Sept. 3 T	HCM pp. 7-6 to 7-13 and 10-27 to 10-34	Traffic Stream Parameters – Interrupted and Uninterrupted Flow	Trip Generation/Distribution – Project Overview
Sept. 5 Th	HCM Ch. 17 Part A	Unsignalized Intersections - Overview	
Sept. 10 T	Example Calculations	TWSC Intersections - Worksheets	HCS - Unsignalized Intersections - TWSC
Sept. 12 Th	HCM Ch. 17 Part B	TWSC Intersections - Applications	
Sept. 17 T	Example Calculations	AWSC Intersections - Overview	HCS - Unsignalized Intersections - AWSC
Sept. 19	TE Ch. 16	AWSC - Applications	

Ī	<u>Date</u>	<b>Reading</b>	<u>Topic</u>	Laboratory Exercise
S	Sept. 24 T	TE Ch. 17	Basic Principles of Signalization	ATLAS - Demonstration
S	Sept. 26 Th	No reading	Signal Design and Timing	
(	Dct. 1 T	HCM pp.16-1 to 26	EXAM 1	MUTCD Warrants/HCS-Signalized Intersections
(	Dct. 3 Th	HCM Ch. 16, pp. 16-26 to 16-86	Signalized Intersections – HCM Methodology	
(	Dct. 8 T	Example Calculations	Signalized Intersections - Applications	HCS - Signalized Intersections - Examples
(	Dct. 10 Th	Example Calculations	Signalized Intersections - Applications	
(	Dct. 17 Th	TE Ch. 19	Signalized Intersections - Left Turns	Signalized Intersection Problems/Sensitivity Analyses
(	Dct. 22 T	TE Ch. 22	Actuated Control - Detection	
(	Dct. 24 Th	TE Ch. 23	Signal Coordination Principles	Group Project Status Meetings
(	Dct. 29 T	TE Ch. 25	Signal Coordination - Applications and Examples	
(	Dct. 31 Th	No reading	Signal Coordination - Computer Models	PASSER-II/TRANSYT-7F/CORSIM - Examples
N	Nov. 5 T	HCM Ch. 7, pp. 7-1 to 7-6, Ch. 13	EXAM 2	
N	Jov. 7 Th	TE Ch. 10	Traffic Flow Parameters- Uninterrupted Flow	HCS - Uninterrupted Facilities - Overview
١	Nov. 12 T	HCM Ch. 23, pp. 23-1 to 23-13	Freeway Capacity Analysis - Overview	
N	Nov. 14 Th	HCM Ch. 23, pp. 23-14 to 23-30	Freeway Segments - Applications	HCS - Freeway Segments - Examples
N	Jov. 19 T	HCM Ch. 25, pp. 25-1 to 25-19	Freeway Segments Examples	
I	<u>Date</u>	<u>Reading</u>	<u>Topic</u>	Laboratory Exercise

Nov. 21 Th	HCM Ch. 25, pp. 25-19 to 25-40	Ramp Junctions - Overview		Traffic Impact Study Presentations	
Nov. 26 T	HCM Ch. 20, pp. 20-1 to pp. 20-11	Ramp Junctions – Applications ar	nd Examples		
Dec. 3 T	HCM Ch. 20, pp. 20-12 to 20-22	Two Lane Highways – Overview	Two Way Segments	HCS - Ramps Analyses - Examples	
Dec. 5 Th	HCM Ch. 20, pp. 20-22 to 20-29	Two-Lane Highways – Directiona	al Segments		
Dec. 10 T	HCM Ch. 4	Two-Lane Rural Highways – Passing Lanes HCS – Two-Lane Rural Highway		HCS – Two-Lane Rural Highways - Examples	
Dec. 12 Th	No reading	Decision Making in Traffic Operational Analysis			
Week of Dec.16		FINAL EXAM			
INSTRUCTOR:	Dr. L. Elefteriadou 223A Sackett, 201B Research Office Building (PTI) Tel: 865-3101 (T, Th) or 863-7923 (M, W, F), e-mail: axe11@psu.edu Office Hours: Tuesday and Wednesday 10:30 a.m 12:00 noon, or by appointment.				
T. A.:	Mr. Ponlathep Lertworawanich, e-mail: pxl172@psu.edu				
COURSE TEXT:	Highway Capacity Manual, Transportation Research Board Special Report 209, 2000				
<b>REFERENCE:</b>	Traffic Engineering, McShane, Roess and Prassas, Prentice-Hall, 1998, Second Edition				
LAB:	Section 1 – Wednesday, 8:00 – 9:55 am, Section 2 – Wednesday, 12:20-2:15 pm				
GRADING:	Exams (3 @ 15 percen Individual Laboratory Quizzes (5 x 3%) Group Traffic Impact S	t each) Assignments Study <u>–</u> To	45 % 15 % 15 % 25 % otal 100 %		