

CE 585 TRAFFIC ENGINEERING AND CONTROL

Spring 2011 Course Syllabus v.0

Lecturer	Eric C. Shen, P.E., PTP Shen.eric@gmail.com ; ericshen@usc.edu (alt.) Mobile/Text: (562) 619-7293
Lectures	6:30-9:10pm Thursday; KAP
Computer Lab	Synchro and SimTraffic 7 installed in KAP-239 Instructional Computer Lab
Field Work	TBD; Mostly conducted independently

I. COURSE SUMMARY

Conceptual engineering geometric design, installation, and calibration of vehicular storage and traffic controls; safe flow optimization of vehicles on various thoroughfares.

Recommended preparation: CE 471: Principles of Transportation Engineering.

II. TOPICS TO BE COVERED

The “*Traffic Engineering: System Operations and Control*” will encompass the following topics:

- Traffic flow theory
- Theories and techniques of data collection, analyses, and design
- Highway and intersection capacity analyses
- Standards
- Applications of traffic control devices
- Channelization design & operations
- Traffic signal system –design & operations
- Integrated traffic management –theories & operations
- Intelligent Transportation Systems (ITS) –Concept, system design, and practice
- Inter-Modal Transportation System –Concept
- Green House Gas Effects

The course will have 2.5 hours of lecture and up to two hours of computer lab work per week. It will also contain a design project. Students will collect traffic data, perform capacity analyses, and develop signal timing parameters by using state of the art simulation models. Depending on the study intersection(s), new traffic signal timing parameters may be implemented by the affected agencies for performance evaluation.

CE 585 TRAFFIC ENGINEERING AND CONTROL

Spring 2011 Course Syllabus v.0

The following software packages may be used in this course:

- 2003 Highway Capacity Software (<http://mctrans.ce.ufl.edu/hcs/hcsplus/>)
- Synchro (<http://www.trafficware.com/synchro.htm>)

Signal timing design and implementation will likely be conducted in conjunction with the Los Angeles City Department of Transportation near Downtown Los Angeles or USC campus. Some field work and data collection outside of the lecture hours may be required to complete independent design project. Appropriate dress for field work and safety awareness will be reviewed throughout the course.

III. TEXT BOOK

Traffic Engineering, 4/E. Roger P. Roess, Elena S. Prassas, and William R. McShane.
Prentice Hall, 2009.

IV. STUDENT EVALUATION

Assignments	40%
Midterm/Final exam(s)	20%
Independent Research/Design Project	40%
TOTAL	100%

CE 585 TRAFFIC ENGINEERING AND CONTROL

Spring 2011 Course Syllabus v.0

V. COURSE OUTLINE

Weeks	Lecture	Assignments
1 & 2	Basic Concepts, Components of traffic system; Canalization	Manual turning counts; automatic counts
3 & 4	Traffic Stream Characteristics; Basic Statistical Concepts; Traffic Volume Studies; Speed Travel Time & Delay Studies	Travel time and spot speed studies
5 & 6	Highway Capacity Analysis (HCS); Basic Freeway Sections; Freeway Weaving Sections; Freeway Ramps; Traffic Signal Design	STOP Warrants Investigation
7 & 8	Traffic Signal Systems – Controller, Detection and Communication; Analysis of Signalized Intersections	Conduct capacity analyses by HCS (Freeway; Non-signalized Intersection)
9 & 10	Signal Coordination & Timing Charts Mid-term Exam	Optimize traffic progression by Synchro 7.0; Develop signal timing parameters
11 & 12	Traffic Synchronization and Preemption Intelligent Transportation Systems, System Design and Integration	Implement signal timing parameters in field; Fine-tuning parameters in field; Measure of Effectiveness (MOE), progression evaluation in field
13 & 14	Intermodal Transportation Planning and Environmental Considerations	TBD
15	Comprehensive Design Project Presentations	
	Final Exam	

VI. Independent Research/Design Project

Students will conduct independent research or design project on traffic control and management related topics. Additional details and instructions will be made available during the first three lectures.

CE 585 TRAFFIC ENGINEERING AND CONTROL

Spring 2011 Course Syllabus v.0

VII. Field Trips

In addition to class-related assignments to be conducted in the field, several tours will be arranged for this class.

- For field trip(s) arranged during the regular lecture hours, attendance will be mandatory. However, when a field trip is arranged at a time other than the regular lecture hours due to agency's availability, attendance will be optional.

Most facilities to be visited are highly advanced and not accessible by the public. Therefore, students should make every effort to attend each field trip. Please note that it may be necessary for you to carpool with other classmates since the school/instructor are not obligated to provide transportation.

Up to three of the following facilities may be visited throughout this semester:

- Los Angeles Metro Light Rail Control Center in Compton
- City of Anaheim Traffic Management Center
- City of Pasadena Traffic Management Center
- County of Los Angeles Traffic Management Center, Alhambra
- Caltrans District 7 Regional Transportation Management Center (LARTMC) in Glendale
- Port of Long Beach Joint Security and Command Center
- City of Los Angeles Automated Traffic Surveillance and Control (ATSAC) Center, Downtown Los Angeles