

CEE 4630 – TRAFFIC ENGINEERING
Elective Course

Catalog Description:

CEE 4630 / 5630 – Traffic Engineering. Lecture 3. Credit 3. Techniques of traffic engineering measurements, investigations, and data analysis; design, application, and operation of traffic control systems and devices. Prerequisite: CEE 3610

Math & Basic Sciences:	0 Credits	Course Coordinator:	Steven M. Click
Engineering Topics:	3 Credits	Contains Significant Design:	No
General Education:	0 Credits	Updated:	2014-06-11
Other:	0 Credits	Specify Type if Other:	

Text Book(s) and Supplemental Material(s):

Highway Capacity Manual, Current Edition, Transportation Research Board, Washington, DC.

Course Goal(s):

The goal of CEE 4630 (5630) Traffic Engineering is to introduce the theory and practice of traffic operations engineering, including traffic stream characteristics, facility types, analysis of highway facilities, analysis of non-highway facilities, and the analysis and applicability of intersection control methods

Instructional Outcomes for the Course:

1. Students should become familiar with the Highway Capacity Manual, including its purpose and its analysis methods.
2. Students should become familiar with traffic stream characteristics such as Volume, Flow Rate, Speed, and Density and operational characteristics such as Facility Types, Capacity, and Level of Service.
3. Students should be able to utilize HCM procedures to analyze uninterrupted flow facilities such as Basic Freeway Segments, Freeway Weaving Areas, Merge and Diverge Areas, and Two-lane Highways.
4. Students should be able to utilize HCM procedures to analyze interrupted flow facilities such as at Two- and Four-way Stops, Roundabouts, Traffic Signals, and Urban Streets.
5. Students should be able to utilize HCM procedures to analyze non-highway facilities like Pedestrian Paths, Bicycle Paths, Shared Pedestrian-Bike Paths, and Transit Routes.
6. Students should become familiar with field data collection methods for operational analysis, including speed studies, volume studies, and traffic signal studies.
7. Students should become familiar with industry-standard software packages like HCS+ and Synchro+SimTraffic.

Criterion 3 Student Outcomes addressed by this Course:

- a) An ability to apply knowledge of mathematics, science, and engineering
- b) An ability to design and conduct experiments, as well as to analyze and interpret data
- c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

- e) An ability to identify, formulate, and solve engineering problems
- i) A recognition of the need for, and an ability to engage in life-long learning
- k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Program Criteria addressed by this Course:

- Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science, consistent with the program educational objectives
- Apply knowledge of four technical areas appropriate to civil engineering
- Conduct civil engineering experiments and analyze and interpret the resulting data
- Explain the importance of professional licensure

Course Topics:

1. Introduction and Flow Concepts
2. Freeway Analyses – Basic Freeway Segments, Freeway Weaving, Ramps and Ramp Junctions
3. Two-lane Highways
4. Unsignalized Intersections – 2-way Stops, 4-way Stops, and Roundabouts
5. Signalized Intersections – Warrants, Timing, Analysis, Urban Streets, and Coordination
6. Non-Highway Facilities – Pedestrian and Bike Paths, Transit Routes
7. Industry Software – HCS+ and Synchro+SimTraffic
8. Special Topics, Professional Issues, and Reviews

Additional Topics/Assignments for dual-level (4000/5000) courses:

Graduate students are required to complete a series of special assignments intended to provide them with greater theoretical background and to require them to work more complex problems. They are also required to complete additional test questions.