Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 5630/04630 – Highway Engineering

2017 Catalog Data:	CEE 5630/4630. Techniques of traffic engineering measurements, investigations, and data analysis; design, application, and operation of traffic control systems and devices. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. 3 Credit hours, 3 Lecture hours
Required Textbook:	Highway Capacity Manual 2010 ed. Transportation Research Board
Faculty Coordinator:	Steven M. Click, PE PhD
Participating Faculty:	n/a
Prerequisites:	CEE 3610 Transportation Engineering
Goal:	Introduce students to concepts of operational analysis, particularly of highway facilities, and allow them to experience operations in real life via small projects.

Course learning objectives:

1. Learn 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.
2. Learn to utilize HCM procedures to analyze interrupted flow facilities such as at Two- and Four-way Stops, Roundabouts, and Traffic Signals
3. Become familiar with field data collection methods for operational analysis, including speed studies, volume studies, and traffic signal studies.
4. Connect textbook explanations of quality of service to real-world conditions on local facilities.
5. Become aware of industry-standard software packages.
6. Build skills in research, more specifically in literature searches, literature reviews, and comparing/contrasting articles.

Major Topics Covered:

- Introduction and Flow Concepts
- Freeway Analyses – Basic Freeway Segments, Freeway Weaving, Ramps and Ramp Junctions
- Two-lane Highways
- Unsignalized Intersections – 2-way Stops, 4-way Stops, and Roundabouts
- Signalized Intersections – Warrants, Timing, Analysis, Urban Streets, and Coordination

Measurable outcomes:

Students will be expected to:

1. Calculate traffic stream characteristics like volume, flow, density, and speed.
2. Analyze uninterrupted facilities like freeways, ramps, weaving sections, and two lane highways to determine operational conditions like quality of service
3. Analyze interrupted facilities like roundabouts, stops, signals, and urban streets to determine operational conditions like quality of service
4. Perform field data collection and analysis of that data for use in speed studies, signal studies, and delay studies.
5. Complete multiple investigations into the fundamental speed-flow-density relationship. Compare and contrast different applications of the fundamental relationship.