



## CE 321 – Transportation Engineering

**Code and Name:** CE 321 – Transportation Engineering

**Credit Hours:** 3 (Lecture: 3, Tutorial: 1)

**Textbook:**

- Traffic and Highway Engineering, N.J. Garber and L.A. Hoel, Cengage Learning, 5<sup>th</sup> Edition, 2015

**Other References:**

- *Highway Capacity Manual (2010)*, Transportation Research Board, National Research Council, Washington, D.C.
- *Principles of Highway and Traffic Analysis by Mannering, F. L., Kilareski, W. P., and Washburn, S. S., John Wiley & Sons Inc. New Jersey, Fifth Edition (2013).*
- *Course handouts: distributed on a regular basis to provide more information on the topic.*

**Course Description:**

An overview of the profession of transportation; transportation systems and organizations. Introduction to vehicle, pedestrian, driver and road characteristics. Traffic engineering studies; fundamental principles of traffic flow; intersection design and control; capacity and level of service for highways and signalized intersections; and transportation planning.

**Pre-requisites:** CE210 Civil Engineering Materials, CE221 Engineering Surveying

**Co-requisites:** None

**Course Learning Outcomes:**

With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)

1. Outline contemporary issues in Civil Engineering related to Transportation (4)
2. Comprehend driver, user, vehicle and roadway characteristics and recognize the interaction among the parameters (4)
3. Conduct capacity and level of service analysis of freeway segments and intersections (2)
4. Apply the techniques and skills to prepare and evaluate traffic data (6)
5. Identify, formulate and solve engineering problems in intersection design and control using AASHTO and HCM methods (1)
6. Design and conduct experiment, analyze and interpret data in transportation planning (6)

**Topics to be covered:**

- Transportation history, transportation system, modes of transportation and transportation organizations.
- Driver, vehicle and road characteristics.
- Studies of spot speed, volume, travel time, delay, and parking.
- Traffic flow elements, speed-flow-density relationship, queuing theory.
- Design principles of at-grade intersections.
- Concepts of traffic control system and signal timing.
- Capacity and level of service for basic freeway segment and signalized intersection.
- Transportation Planning and Travel Demand Forecasting

**Grading Policy:**

The grading for the course is: 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, and home works for the remaining 20% that is modified by the course instructor.

