

1. CEE 3610 – Transportation Engineering
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics
3. Course coordinator: Daniel A. Badoe
4. Textbook: Principles of Highway Engineering and Traffic Analysis 7th Ed., Fred Mannering and Scott Washburn, 2020

5. Course information:

2020 Catalog description	Introduction to transportation engineering; planning, location, design, and operation of transportation facilities.
Prerequisite(s)	CEE 3020
Course type	Required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Knowledge of basic descriptors of the transportation system of a region	1
CO2	Understand the contemporary societal issues relating to energy, pollution, safety, financing of transportation infrastructure, etc. addressed by transportation engineers	2
CO3	Perform simple analysis associated with the planning of transportation systems, namely, trip generation, trip distribution, mode choice, and traffic assignment	1, 2
CO4	Design crest and sag vertical curves to satisfy sight distance, drainage, aesthetic, comfort requirements, and compute elevations along a roadway's vertical alignment	1, 2
CO5	Design horizontal circular curves: determine minimum radius of curve to satisfy friction and superelevation requirements; design circular curves to satisfy sight distance requirements; determine length of transition curves to satisfy comfort requirement, and determine the setting out details for circular curves	1, 2
CO6	Plot cross-section and compute areas of cut and fill at these sections, and determine the volumes of cut and fill associated with earthworks	1, 2
CO7	Know definition of noise, how it is measured, how it is propagated, and how noise levels at a site may be attenuated	1, 2

CO8	Analyze the performance of transportation facilities, namely, determining capacity, delay, speeds, headway, flow, and volumes for highways and isolated signalized intersections	1, 2
CO9	Evaluate the level of service a basic freeway segment operates at given a set of geometric and traffic conditions	1, 2

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

7. Course topics:

1. Transport Policy (14%)
2. Transport Planning - Models (14%)
3. Transport Facility Design - Roadway, Railroad, and Airport (35%)
4. Transport Operations (35%)
5. Environmental Impacts – Noise (2%)

Program criteria (curriculum) addressed by this course:

1. Analyze and solve problems in at least four technical areas appropriate to civil engineering
2. Design a system, component, or process in at least two civil engineering contexts
3. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science

6. Additional topics, assignments, or requirements for dual-level (4000/5000) course:

N/A

7. Date: 02/05/2020