

Course	CE 34500 – Transportation Engineering
Type of Course	Required for Civil Engineering Program
Catalog Description	Transportation functions; transportation systems, including land, air, and marine modes; transportation system elements, including traveled way, vehicle, controls, and terminals; techniques of transportation system planning, design, and operation.
Credits	3
Contact Hours	3
Prerequisite Courses	CE 21000.
Corequisite Courses	None
Prerequisites by Topics	Introduction to Geomatics
Textbook	Garber and Hoel, <i>Traffic and Highway Engineering</i> , Brooks/Cole, Current Edition.
Course Objectives	To provide basic knowledge in transportation so that students can understand and be able to solve transportation related problems and design for highway mode of transportation with focus on highway users' characteristics, geometric and pavement design, traffic engineering, and transportation planning.
Course Outcomes	Students who successfully complete this course will be able to: <ol style="list-style-type: none">1. Understand the characteristics of the driver, the pedestrian, the bicyclist, the vehicle, and the road. [1]2. Understand basic traffic stream parameters, traffic flow models, and queuing theory. [1]3. Perform level of service analysis to determine LOS for selected highway segments. [1, 2]4. Use Highway Capacity Software (HCS) for finding LOS. [1, 2]5. Design basic traffic signal phasing and timing plan. [2]

6. Be familiar of the four stages of the transport planning and prediction models. [1, 2]
7. Design basic horizontal alignment of the highway. [2]
8. Design basic vertical alignment of the highway. [2]
9. Use EXCEL tools for design of vertical and horizontal curves. [7]
10. Understand factors involved in traffic crashes, safety performance measures, collision and condition diagrams, and crash reduction factors. [1, 2]
11. Understand and use AASHTO method for soil classification. [1, 2]
12. Design of flexible pavement layers. [2]
13. Design transportation related project in a team of two or three students and submits a final report. [1 to 7]

Lecture Topics

1. Introduction
 - a. Transportation System
 - b. Highway Users Characteristics
2. Geometric Design
 - a. Geometric Design of Highway Facilities
3. Traffic Operation
 - a. Fundamentals of Traffic Flow Theory
 - b. Highway Capacity of Freeways and Two-Lane Highways
 - c. Capacity and Level of Service at Signalized Intersections
4. Transportation Planning
 - a. Forecasting Travel Demand
5. Highway Safety
 - a. Performance measures and computational procedures for safety effectiveness
6. Pavement Design
 - a. Design of Flexible Pavement

Computer Usage

Medium

Laboratory Experience

None

Design Experience

Medium

Coordinator

Promotes Saha, Ph. D.

Date

January 8, 2024