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| **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, *Traffic and Highway Engineering*, 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:<br>1. Understand the factors influencing road vehicle performance characteristics and design. [1]<br>2. Apply basic science principles in estimating stopping and passing sight distance requirements. [2]<br>3. Understand basic traffic stream parameters and models, traffic flow models, and queuing theory. [1]<br>4. Perform level of service analysis to determine LOS for selected highway segments. [1, 2] |

5. Use Highway Capacity Software (HCS) for finding LOS. [1, 2]
6. Design basic traffic signal phasing and timing plan. [2]
7. Be familiar of the four stages of the transport planning and prediction models. [1, 2]
8. Design basic horizontal alignment of the highway. [2]
9. Design basic vertical alignment of the highway. [2]
10. Understand and use AASHTO method for soil classification. [1, 2]
11. Design of flexible pavement layers. [2]
12. Calculate the stresses and deflections in pavements. [1]
13. Use EXCEL tools for design of vertical and horizontal curves. [7]
14. 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. Pavement Design
   a. Design of Flexible Pavement

**Computer Usage** Medium

**Laboratory Experience** None

**Design Experience** Medium

**Coordinator** Promothes Saha, Ph. D.

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