**Instructor:** Promothes Saha, Ph.D., P.E.

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**Office Hours:** Mondays and Wednesdays 3:00 – 5:30 PM or by Appointment.

**Course Website:** All course material and grades will be posted to the Blackboard site.

# Textbook: Garber and Hoel, Traffic and Highway Engineering, Brooks/Cole, Current Edition.

# Course 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.

*Prerequisite: CE 21000 Introduction to Geomatics*

# 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 Evaluation:

Participation: 5%

Quizzes: 5%

1st exam:15%

2nd exam: 15%

Final Exam: 15%

Course Project: 20%

Homework: 25%

# Grading Range:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Grade* | *Percentage* |  | *Grade* | *Percentage* |
| A | 93 ≤ Score ≤100  |  | C | 73 ≤ Score < 77  |
| A- | 90 ≤ Score < 93  |  | C- | 70 ≤ Score < 73  |
| B+ | 87 ≤ Score < 90  |  | D+ | 67 ≤ Score < 70  |
| B | 83 ≤ Score < 87  |  | D | 63 ≤ Score < 67  |
| B- | 80 ≤ Score < 83  |  | D- | 60 ≤ Score < 63  |
| C+ | 77 ≤ Score < 80  |  | F | Score < 60 |

# Tentative Schedule of Course Topics:

| ***Week*** | ***Topic*** |
| --- | --- |
| 1. Jan 13 | Chapter 1: The Profession of TransportationChapter 2: Transportation Systems and Organizations |
| 2. Jan 20 | Chapter 3: Characteristics of the Driver, the Pedestrian, the Vehicle, and the Road |
| 3. Jan 27 | Chapter 6: Fundamental Principles of Traffic Flow |
| 4. Feb 3 | Chapter 6: Fundamental Principles of Traffic Flow |
| 5. Feb 10 | Exam 1 review and , **Exam 1 (Wed, Feb 12)** |
| 6. Feb 17 | Chapter 9: Capacity and Level of a Service for Highway Segments |
| 7. Feb 24 | Chapter 9: Capacity and Level of a Service at Signalized Intersections |
| 8. Mar 2 | Chapter 12: Forecasting Travel Demand |
| **Mar 9-15, Spring Break** |
| 10. Mar 16 | Chapter 12: Forecasting Travel Demand |
| 11. Mar 23 | Exam 2 review and, **Exam 2 (Wed, Mar 25)** |
| 12. Mar 30 | Chapter 15: Geometric Design |
| 13. Apr 6 | Chapter 15: Use Excel tools for design of vertical and horizontal curves |
| 14. Apr 13 | Chapter 17: Soil Engineering for Highway Design  |
| 15. Apr 20 | Chapter 20: Design of Flexible Pavements, Calculate the stresses and deflections in pavements |
| 16. Apr 27 | Review session of final exam, and **course project presentation** |
| May 4-10 | **Final Exam (Mon, May 5)** |

# Course Outcomes:

Students who successfully complete this course will be able to:

1. Understand the factors influencing road vehicle performance characteristics and design. [1]
2. Apply basic science principles in estimating stopping and passing sight distance requirements. [2]
3. Understand basic traffic stream parameters and models, traffic flow models, and queuing theory. [1]
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]

# Professional Responsibilities:

*Attendance* – Purdue University at Fort Wayne has a policy on absences: <http://bulletin.ipfw.edu/content.php?catoid=25&navoid=639> . Students are expected to attend all classes. Attendance will be taken in the class. In case, a student misses a class, he/she is responsible to cover the class. Excessive absences may lower your grade (more than 7%).

*Late Assignments* – Late assignments will not be accepted. All assignments are due at the beginning of the class period on the date due unless otherwise stated.

***Harassment, Discrimination, and Sexual Misconduct –*** Students should read the [Student Handbook](https://www.pfw.edu/microsites/student-handbook/docs/2017-2018-IPFW-Student-Handbook-508-Compliant-DIGITALv2.pdf) carefully and know they are responsible for the content. The Purdue University Fort Wayne is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated. All students are expected to maintain professional behavior in the classroom setting (discussion threads, e-mails, and chat rooms are all considered to be equivalent to classrooms).

*Academic Honesty –* Academic honesty is expected of all Purdue University students. Academic dishonesty includes, but is not limited to cheating, plagiarism, and theft. Any student found guilty of academic dishonesty is subject to disciplinary action, which may include, but is not limited to, (1) a failing grade for the test or assignment in question, (2) a failing grade for the course, or (3) a recommendation for dismissal from the University. (See University’s webpage: <https://www.pfw.edu/committees/senate/regulations/honesty.html>

*Disabilities Statement**–* If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of Services for Students with Disabilities (Walb Union Bldg., Room 113, telephone number (260.481.6658) as soon as possible to work out the details. Once the director has provided you with a letter attesting to your needs for modification, bring the letter to me. For more information, please visit the web site for SSD <http://www.ipfw.edu/disabilities/> .