CE332 Introduction to Transportation Engineering

Fall 2018

Department of Civil and Environmental Engineering, West Virginia University

Course Syllabus

I. General Information

Instructor:	Dr. Kakan C Dey
Office:	ESB Room 647
Phone:	Office: 304-293-9952
Email:	kakan.dey@mail.wvu.edu
Text Book:	*Principles of Highway Engineering and Traffic Analysis*, Fred L. Mannering, Scott S. Washburn, Sixth Edition, John Wiley & Sons, 2017.
Other references:	The instructor will provide additional materials from other sources.
Meeting:	M, W, F 09:00AM-09:50AM, ESB G83 M 03:00-04:50PM, ESB G83
Office Hours:	Tuesday 2:00PM-6:00PM* and by appointment
Pre-requisite:	MATH 156 with a minimum grade of C-

II. Course Description

Transportation engineering involves the planning, design, operation, management and maintenance of transportation systems for all modes of transportation. Transportation engineers ensure the safe and efficient movement of people and goods. The objective of this course is to provide students with a solid introduction to the principles of transportation engineering as related to several areas, from transportation planning and highway engineering to operations and traffic analysis. Moreover, this course will demonstrate the interdisciplinary nature of transportation engineering and explore the multimodality of transportation systems.

This course has both lecture and project components. In lecture, you will be taught the technical and non-technical elements of the various topics and will be given opportunities to exercise these principles through homework assignments. The project component will provide you experience in addressing contemporary issues in transportation through a term project and multiple small projects.

In addition, this course will provide the basic skills that will allow students to solve transportation-related problems likely to appear on the Fundamentals of Engineering (FE) exam and the Principles and Practice of Engineering (PE) exam.

a) Specific outcomes of instruction: Upon successful completion of the course.

Learning outcomes	Student outcome
Students will be able to account for the impact of driver, vehicle, and roadway characteristics in design of highway elements.	A, E
Students will be able to design basic horizontal and vertical curves using safe stopping sight distance.	E
Students will be able to calculate traffic flow parameters and solve basic traffic flow models.	A
Students will be able to use queuing principles to estimate total vehicle delay in a transportation network, because of queuing.	A
Students will increase their proficiency in oral and written communications.	G

**I will make every effort to be in during scheduled office hours. However, travel commitments and other University duties may require that I sometimes miss scheduled office hours. If you will be making a special trip to ESB for my office hours, it is recommended to email me ahead to be sure that I am in.*

(b) Accreditation Board for Engineering and Technology (ABET) Program student outcomes applicable to this course:

(A) An ability to apply knowledge of mathematics, science, and engineering
(E) An ability to identify, formulate and solve civil engineering problems
(G) Communicate effectively in oral, written, and electronic format

III. Tentative List of Topics

The outline of the course will follow the text book closely for most of the lectures. The instructor will assign additional reading materials as needed for selected lectures.

Topic #	Description
1	Introduction to the fundamental issues in transportation (Ch. 1)
2	Factors influencing the highway design process and highway safety: Driver, vehicle and roadway characteristics (Ch. 2)
3	Geometric design of highways (Ch. 3)
4	Pavement design (Ch. 4)
5	Fundamentals of traffic flow and queueing theory (Ch. 5)
6	Highway capacity and level of service analysis (Ch. 6)
7	Pavement marking and traffic signs
8	Traffic control and analysis of signalized intersections (Ch. 7)
9	Transportation planning (Ch. 8)
10	Traffic safety
11	Public transportation
12	Transportation economics
13	Intelligent transportation systems

IV. Attendance and Class Participation

Students are encouraged to attend all lectures and participate in class activities such as in-class exercises, class discussion on different topics to maximize their learning outcomes. Class participation will count for borderline consideration at the discretion of the instructor in assigning final grades. Also, some concepts that you will be tested on are not covered in the book.

V. Homework/Assignment

There will be total seven to nine assignments. Homework will be assigned throughout the semester. Assignments will be collected on the due dates. **Late homework will be penalized at 20% per day**. Homework **MUST** be turned in **AT THE BEGINNING** of class on due dates.

VI. Group Course Project (Semester Project)

The laboratory portion of this course (1 credit hour) will consist of a comprehensive research and communication experience based on transportation-oriented problems of your choosing. Through this assignment, you will demonstrate your technical competence, understanding of the field of transportation, and ability to organize and express your points and ideas. The length of the paper should be approximately 15 pages double-spaced. Through the term paper, you will demonstrate your technical competence, understanding of the field of transportation, and ability to organize and express your points and ideas. The paper will be developed in an iterative fashion where you will receive feedback. In addition to the term paper, you will give a 15-minute presentation of your topic. *More information will be given to you on the course project as the course progresses.*

VII. Group Small Projects
Multiple small projects will be assigned, where students will apply the concepts learned in this course to collect and analyze data to calculate traffic and transportation system characteristics. Students will prepare a brief report on each small project. *More information will be given to you as the course progresses.*

VIII. Exams
Students are expected to take the tests at the scheduled time and date. Only in exceptional circumstances, changes will be made.

Two Mid-term Tests:
Date will be announced in the class for mid-term tests.
Final Exam:
2PM to 4PM, Tuesday, December 11

IX. Grading Distribution
The graded course requirements will consist of the following:

Assignments	10%
In-Class Exercises & Class Participation	10%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	20%
Semester Project	20%
Small projects	10%

X. Grading Policy

90-100: Grade A; 80-89.9: Grade B; 70-79.9: Grade C; 60-69.9: Grade D; <60: Grade F

XI. Other Course Policies
Students are expected to take all exams at the scheduled time. Only in exceptional circumstances students will be permitted to postpone exams, and advance approval from the instructor is mandatory.

Students are excused after fifteen (15) minutes if the instructor is late for the class.

Students are not allowed to use laptop/smart phone in the class room.

Academic Standards: Students are expected to maintain the WVU's academic standards and can be accessed at http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/

Neatness: Clarity and neatness of work is an important aspect of professionalism in engineering. To get maximum credit, assignments and project reports must be neatly organized, with sections clearly labeled and calculations and assumptions shown.

XII. Inclusivity Statement
The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (304-293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see http://diversity.wvu.edu.