CE 439/539: Traffic Engineering and Operations
Spring 2018
Department of Civil and Environmental Engineering, West Virginia University
Course Syllabus

I. <u>General Information</u>

Instructor:	Dr. Kakan C Dey
Office:	ESB Room 647
Phone:	Office: 304-293-9952
Email:	kakan.dey@mail.wvu.edu

Text Book: *Traffic Engineering 2010*, 4th Edition, Roger P. Roess, Elena S. Prasass, William R. McShane, Prentice Hall.

Other references: i) *Highway capacity manual 2010*, Transportation Research Board, National Research Council, Washington, DC.
ii) *A Policy on Geometric Design of Highways and Streets 2011*, American Association of State Highway and Transportation Officials (AASHTO).

Meeting:	M, W, F 09:00AM-09:50AM, EVC-E 414
Office Hours:	Monday 2:00PM-5:00PM* and by appointment
Pre-requisite:	CE 332

II. <u>Course Description</u>

This course covers diverse topics related to traffic engineering and operations, which includes driver and vehicular characteristics, horizontal and vertical curve design, traffic flow theory, analysis of traffic engineering data, traffic engineering studies, design of signalized and unsignalized intersections, traffic signal analysis and design, and intelligent transportation systems (ITS) technologies in traffic control.

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

Learning outcomes	Student outcome
Students will be able to determine relationship between traffic demand and supply, and highway infrastructure characteristics	A,E
Students will be able to design and analyze the performance of signalized an unsignalized intersections	C
Students will be able to design horizontal and vertical curve	C
Students will be able to evaluate traffic improvement alternatives by using different traffic engineering concepts	A,E
Students will able to apply the intelligent transportation engineering solutions and simulation tools to diverse traffic engineering problems	J,K

(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
  (C) An ability to design civil engineering projects and components of projects
  (E) An ability to identify, formulate and solve civil engineering problems

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*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.

(J) An ability to acquire knowledge of contemporary issues
(K) An ability to use techniques, skills, and modern engineering tools

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	Basic Components and Elements of Traffic System
2	Horizontal Curve Design
3	Vertical Curve Design
4	Statistical Analysis Techniques
5	Traffic Engineering Data Collection
6	Principles of Highway Capacity Analysis
7	Freeway Weaving
8	Freeway Ramps
9	Two-Lane Highway Analysis
10	Intersection Traffic Control
11	Unsignalized Intersection Analysis
12	Traffic Signalization Concepts, Design and Analysis
13	Traffic Signal Coordination
14	ITS Technologies in Traffic Control

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 from this course. 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 eight to ten 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. Simulation Project(s) and Term Project

Student will have one simulation projects where they will use VISSIM Traffic Simulation Software to simulate an intersection/roadway segment. More information will be provided in the class.

CE 539 students will be required to make a presentation on a contemporary traffic engineering issue. Select a topic and submit a one-page summary, which will include objectives of your research and methodology for conducting the research, to the instructor by February 5th. If your topic is accepted, develop a presentation on the topic and make a 15 minutes' presentation to the class. The presentations will be in April. The exact date of the presentations will be announced in class.

VII. 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, May 1

VIII. Grading Distribution

The graded course requirements will consist of the following:

	Undergraduate	Graduate
Assignments	10%	10%
In-Class Exercises & Class Participation	10%	10%
Midterm Exam 1	20%	15%
Midterm Exam 2	20%	15%
Simulation Project	15%	15%
Final Exam	25%	25%
Term Project	---	10%

IX. Grading Policy

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

X. 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 <u>mandatory</u>.

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. Instructor will inform students to bring laptop for few classes.

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.

XI. 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 (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see http://diversity.wvu.edu.