TRAN 755 Intelligent Transportation Systems

Fall 2016

Brief Course Description

This course will discuss the fundamental concepts and practices of Intelligent Transportation Systems (ITS). The major topics of this course cover 1) Active Transportation and Demand Management (ATDM), 2) Integrated Corridor Management (ICM), 3) Connected Vehicles, and 4) Data Collection and Communications Technologies for ITS. Students will be assigned to a group project to hone hands-on experiences of designing and evaluating real-world ITS applications. Every individual of this class will be asked to perform a term project.

Course Objectives

1. Understand the fundamental concepts of Intelligent Transportation Systems
2. Gain working knowledge of emerging ITS applications
3. Exposure to the best practices of ITS
4. Examine the gaps and challenges of current ITS applications
5. Have capabilities to identify and solve transportation problems within the context of ITS applications

Instructors

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Teaching Assistant/Grader

TBD

Lecture Hours and Location

TBD; Cullimore Hall LECT 3

Prerequisite

CE 350 Transportation Engineering

Textbook & References:

The primary reading material of this class is **ITS-ePrimer** (http://www.pcb.its.dot.gov/ePrimer.aspx). Additional reading materials will be provided by the instructor based on topics during lecture which will be accessible through Moodle. The reading material for the class comes primarily from the instructor's handouts and online references provided during lectures. The following references are optional reading:

- Sussman, Joseph. Perspectives on Intelligent Transportation Systems (ITS). New York, NY: Springer, 2010.

- Mashrur A. Chowdhury, and Adel Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, Inc., 2003.

Grading

Final Exam: 30%
Term Paper: 30%
Group Project: 40%
Attendance: -5%
Extra Credit: + 5%

Group Project

The class will be divided into 4 ~ 6 groups (i.e., up to 3 members per each group) to conduct a hypothetical ITS design project. Given scenarios reflecting real-world practices, each group will propose the most desirable ITS application to deal with the given problem and prove the effectiveness of their proposal visually and numerically. The time line of the group project schedule is as follows.

- 10/9/2016 : Complete grouping and submit topic
- 12/4/2016 : Final Presentation & Final Report

Term Paper

Each student will conduct a term paper for a selected topic. The primary purpose of the term paper is to let students 1) scan previous research efforts related to the topic; 2) examine the gaps and challenges of the previous efforts; and 3) come up with new idea(s) to fill out the gaps and overcome the challenges. Choosing a topic for the term paper is up to student. Each student will be presenting the progress of the term project; the presentation schedule will be announced during lecture.

Exam/Homework Policies

- Exam: All exams will be in-class closed book. Students are allowed to bring their own one-page formulation sheet which must be submitted to the instructor along with the question and answer sheet at the end of each exam.
- Homework: Problems will be assigned to reinforce course learning objectives. The assignments will be targeted to provide practice for methods that may be included in course exams. Homework should be turned in at the start of the class period identified by the instructor. No late homework will be accepted.
- Collaborating, sharing, and/or copying for exam/homework is **NOT** allowed. Credit will not be given to individuals who either asked or allowed such behaviors. The NJIT honor code will be upheld and any violation will be brought to the immediate attention to the Dean of Students. See http://studentsenate.njit.edu/wp-content/uploads/2010/03/University_Code_on_Academic_Integrity.pdf

Class Polices

- Cell Phones and mobile devices (e.g., Laptop, IPad/Tablet PC, IPod, etc.): Cell Phone should be turned off prior to coming to class. Texting and the use of mobile devices during the class shall not be allowed.
- Each student will be excused to miss up to two classes with prior permission/**VALID** reason. Each subsequent class missed will cost the student up to 5% of the overall grade. Five (5) or more missed classes will result in an F grade.

Course Schedule (Subject to be changed at any time)

Lecture (Date)	Topic
1	- Course Overview - Introduction to ITS
2	- National/State ITS Architecture - Data Collection Technologies
3	- Data Collection Technologies & Performance Measures
4	- Lab: Traffic Data Collection (Bluetooth-based travel time, Video-based count)
5	- Active Transportation and Demand Management(ATDM)
6	
7	- Term paper presentation/Final Paper Draft
8	- Integrated Corridor Management
9	- Integrated Corridor Management - Adaptive Traffic Signal Control - Final Paper
10	
11	- Connected Vehicles
12	
13	- Thanksgiving Recess. No class
14	- Group Project Final Presentation and Final Report
15	- Final Exam