1.212

AN INTRODUCTION TO INTELLIGENT TRANSPORTATION SYSTEMS

SPRING 2001

THURSDAYS

2:00 p.m. - 5:00 p.m.

ROOM 5-232

Professor Joseph M. Sussman (Lecturer)
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AN INTRODUCTION TO INTELLIGENT TRANSPORTATION SYSTEMS (1.212) -- SPRING 2001

Professor Joseph M. Sussman **Room 1-163** **253-4430** **<sussman@mit.edu>**

Thursdays, 2 - 5 p.m. 3 - 0 - 6 Room 5-232

Intelligent Transportation Systems (ITS) represent a major transition in transportation on many dimensions. In this class, we consider ITS as a lens through which one can view many transportation and societal issues. ITS is an international program intended to improve the effectiveness and efficiency of surface transportation systems through advanced technologies in information systems, communications and sensors. In the U.S., ITS represents the major post-Interstate-era program for advancing surface transportation in highways and public transportation, and is potentially comparable to the air traffic control system in impact.

The purpose of this subject is to introduce students to the basic elements of ITS, focusing on technological, systems and institutional aspects. Topics include advanced traveler information systems; transportation network operations; commercial vehicle operations and intermodal freight; public transportation applications; ITS and regional strategic transportation planning, including regional architectures: ITS and changing transportation institutions, ITS and safety, ITS as a technology deployment program, research, development and business models, ITS and sustainable mobility, travel demand management, electronic toll collection, and ITS and road-pricing.

The subject should be of interest to students interested in the general area of transportation; performance, control and management of transportation systems; urban systems; the deployment of advanced technology systems; and transportation policy and societal issues.

Based on lecture material and readings in the ITS literature, students will submit two assignments in the first half of the semester. A term project is also required, to be submitted at the end of the semester.

1.212 CLASS SYLLABUS

Spring 2001

Lecture	Date	Topic
1	February 8	Introduction to ITS Basic Concepts
2	February 15	Advanced Transportation Management Systems (ATMS) / Advanced Traveler Information Systems (ATIS) I
3	February 22	ATMS / ATIS II -- Traveler Information: What, How, and Why; ITS and the Internet (Jane Lappin, Volpe National Transportation Systems Center *)
4	March 1	ATMS / ATIS III -- Algorithms, Complex Systems, Congestion Pricing, Electronic Toll Collection (Prof. Ismail Chabini, MIT *)
	March 8	no class
5	March 15	Commercial Vehicle Operations (CVO) and Intermodal Freight (Michael Wolfe, North River Associates *)
6	March 22	Advanced Public Transportation Systems (APTS), Electronic Payment Systems (Carol Schweiger, Multisystems *)
	March 29	--- Spring Break ---
7	April 5	ITS Evaluation (Dan Kretchner, Cambridge Systematics *)
8	April 10	ITS Massachusetts Annual Meeting (VNTSC)
9	April 12	Technological Basis of ITS -- Trends in the "ITS-4" (sensing, communication, information processing, algorithms)
10	April 19	ITS / Safety / Security / Human Factors / "MayDay"
11	April 26	ITS and Regional Planning: The Concept of a "Regional Architecture" ITS, Information and Public / Private Partnerships / Standards / "Transportation / Information Infrastructure" (Prof. Jonathan Gifford, George Mason University *)
12	May 3	ITS Institutional Issues, including Legal Issues, Privacy ITS: International Outlook in the Developing and Developed World
13	May 10	What Have We Learned About the Future of ITS and Where Do We Go from Here?
14	May 17	Term Projects Presentation

* Guest lecturers will generally teach half of the 3-hour block. Others may be added later.

STUDENT REQUIREMENTS

1. Two (2) short (7-10 pages) assignments.
2. Readings
3. Discussion Articles -- We will distribute two articles that will be discussed (interactively) at the next lecture. We will ask you to write a brief summary of the article to be submitted before the discussion.
4. Term Paper (about 15 pages -- topic to be "negotiated" with Professor Sussman)

   Example topics:

   A. Critical review of selected ITS literature

   B. A paper or analysis on some topic of interest to you.

      Examples:

      -- ITS: Perspectives of an environmentalist
      -- Cost/Benefit analysis of ATIS technology
      -- Network algorithms: Some ideas
      -- Traffic light/expressway coordination: State of the art
      -- Is transportation capacity politically correct?
      -- Regional development and ITS
      -- ITS and sprawl
      -- ITS and intermodal freight

5. Class Participation

GRADING

2 Assignments	40%
Term Project	50%
Class Participation	10%

ASSIGNMENT DATES

Assignment	Distributed	Due
1	February 8	March 1
2	March 1	March 22

TERM PROJECT DATES

Proposal Due (1-2 pages):	March 23 (last day before Spring Break)
Discussions of your topic with Professor Sussman:	April 2 to April 4
Term Project Due:	May 17

REFERENCES

Intelligent Transportation Primer, Institute of Transportation Engineers, Washington, DC, 2000.

Introduction to Transportation Systems, Joseph M. Sussman, Artech House Publishers, Boston and London, 2000 (Chapters 24 and 25).

"What Have We Learned About Intelligent Transportation Systems (ITS)?" EDL #13316, http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/@9w01!.pdf, U. S. Department of Transportation, Washington, DC, 2000 (to be distributed).

Views on ITS, Working Document, Joseph M. Sussman, et al., 2001 (to be distributed).

"ITS Handbook 2000" Recommendation from the World Road Association, (PIARC), edited by Kan Chen and John C. Miles.