

## **Course Description: CVEEN 7540 Intelligent Transportation Systems**

***Offered Spring***

### ***Catalog Data***

3 Credits: The vehicle, the systems, the driver, information technology, and ITS infrastructure.

### ***Textbook***

None - ITS is too new a field to have a recommended text. There will be assigned reading and plenty of background reading.

***Coordinator: Peter T. Martin***

### ***Goals***

Intelligent Transportation Systems “ITS”, is the collective application of the following information and control technologies to surface transportation:

- operating our transportation system more effectively
- moving goods efficiently by connecting the modes of free transportation
- intelligently satisfying the demands for mobility and access
- promoting modal shift through encouraging car pools, van pools, and the use of public transportation
- introducing congestion pricing systems, on a moderate scale
- and when practicable, eliminating the need for travel through virtual travel

The learning should equip the student to:

- Have a basic understanding of the emerging field of ITS
- Acquire a critical view of the state of the art of the field

### ***Prerequisites***

CVEEN 3520 or instructor consent

### ***Topics***

- What is ITS? , The nature of ITS, System Architecture
- Information retrieval systems, Networking & Telecommuting
- ITS Architecture, System Procurement, Rural Issues, Privacy Issues
- The National ITS Architecture Program
- Evaluation of System Performance, Field Equipment, Info com technology
- Automated Snow Avalanche Detection Systems
- Microwave and optical communication technologies
- Video Imaging Systems
- Human Factors and Intelligent Transportation Systems
- Electronic Tolling, Real time flow monitoring
- Artificial Intelligence
- Advanced signal control systems, Incident Management, Ramp Metering
- Quickchange Moveable Barrier (QMB) system
- Geographic Information Systems
- Traffic Operations Centers, Automated Highway Systems

***Computer Usage: None***

***Laboratory Projects: None***

### ***Course Content***

#### ***Institutional Aspects***

What is ITS?

System Architecture

System Procurement

Evaluation of ITS Projects

Rural ITS Issues

ITS and Privacy

#### ***Core Technologies***

Artificial Intelligence

Vehicle Sensors

ITS Field Equipment

Communication Technology

Microwave and optical devices

Video Imaging

GIS(T)

*ITS Research*

Automated avalanche warning systems

Real-Time Flow Inference models

Electronic Road Tolling

Human Factors and ITS

Information retrieval systems

*State of the Art Review*

Automated Highway Systems

Advanced Traffic Control Systems

Incident Detection and Response

Ramp Metering

Automated Barrier Systems

Traffic Operations Center Design