



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Instrumentation, Signals, and Control in Transportation Applications

ECE 5400

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Interdisciplinary course bringing together electrical engineering tools and transportation applications. Students gain valuable experience working in teams while learning traffic flow, surveillance and control.

Prerequisites and Co-requisites:

Prereq: 2020 and 2050, and Math 2415; or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences; or permission of instructor.

Course Goals / Objectives:

- Be exposed to working in a teamwork environment that is representative of the work strategies found in industry and research
 - Be competent in addressing an interdisciplinary topic with a holistic approach that bridges Civil Engineering and Electrical Engineering (and to a lesser degree, other disciplines such as computer science and city planning)
 - Master traffic flow theory, traffic surveillance and traffic control.
 - Be competent in managing and manipulating large quantities of raw data. This objective will include basic tasks such as working with analysis tools (e.g., Matlab).
 - Be competent in distilling meaningful information from large quantities of sensor data. Applications will include traffic control, traffic flow theory, and driver behavior (e.g., car following models).
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Course Topics:

- Traffic flow theory- what are we monitoring and why?
 - Existing traffic surveillance and control- hardware and software- how do we monitor and control traffic today and what are the shortcomings?
 - Signals, shocks and disturbances- the waves that propagate through the traffic stream how do they travel and how do they affect traffic?
 - New traffic surveillance technologies and traffic control methods
 - Working with data analysis tools, e.g., Matlab
 - Group/Team work through homework assignments and presentations
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Designation:

Elective