THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Vehicle System Dynamics and Control

MECHENG 8322

Credit Hours:
3.00 - 3.00

Course Levels:
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Control and estimation system designs for vehicle systems.

Prerequisites and Co-requisites:
Prereq: Grad standing in Engineering, or permission of instructor.

Course Goals / Objectives:
- Introduce control and estimation system designs for vehicle systems
- Discuss a variety of linear and nonlinear control and estimation design techniques that are particularly useful for ground vehicle systems
- Describe techniques on combinations of ground vehicle system characteristics with control and estimation theories
- Introduce new research development/progress in this active field

Course Topics:

- Overview of current vehicle control systems: sensors, actuators, and controls
- Introduction to static and dynamic tire models
- Vehicle motion and control-oriented dynamic models
- Nonlinear control and estimation design techniques
- Tire-road friction coefficient estimation
- Vehicle parameter on-line estimation
- Tire slip control: braking and traction
- Electronic stability control and torque-vectoring control
- Active steering control
- Active rollover prevention and control
- Control of vehicles with independently-actuated wheels

Designation:

Elective