



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Guidance, Navigation, and Control of Aerospace Vehicles

AEROENG 5621

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Spacecraft (satellite) control systems analysis and design.

Prerequisites and Co-requisites:

Prereq: 3521 (521).

Course Topics:

- Review of Equations of Motion for Orbit Dynamics and Spacecraft (Satellite) Attitude dynamics in Principal Axes frame
 - Single and Dual Spin Stabilization; Active Nutation Control; Despinning and Denutation of a satellite; Active Momentum bias stabilization
 - Gravity Gradient Stabilization with passive and active damping; with three axis magnetic active damping
 - Momentum Wheel (Reaction Wheel) based Active Three axis attitude control systems
 - Reaction Jet based Active Three axis Attitude Control Systems; Combination of these with various types of measurements
 - Attitude maneuvers in Space; Active Control using momentum exchange devices, magnetic torquers; Time optimal attitude control
 - Attitude Sensors and Orbit and Attitude control hardware.
 - Reentry Dynamics; Rocket/Missile gravity turn trajectories
 - Structural Flexibility Effects; Liquid Sloshing
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Designation:

Elective