



# Robust Multivariable Control with Applications

## AEROENG 8850

**Credit Hours:**

3.00 - 3.00

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**Course Levels:**

Graduate (5000-8000 level)

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**Course Components:**

Lecture

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**Course Description:**

Advanced concepts for robust control of uncertain dynamic systems with applications.

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**Prerequisites and Co-requisites:**

Prereq: 5620 or 5621 or ECE 6750, or permission of instructor.

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**Course Goals / Objectives:**

- Learn advanced methods of control of uncertain dynamic systems that possess robustness to perturbations and disturbances
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**Course Topics:**

- Introduction to Uncertainty and Robustness
  - Modeling Errors and Uncertainty Characterization in Time Domain State Space framework and frequency domain transfer function framework
  - Robust Stability Analysis for Linear Systems with Norm bounded (Unstructured) Uncertainty as well as Structured Uncertainty in State Space framework; Stability Robustness Bounds for Time Varying perturbations and Time Invariant perturbations
  - Robust Stability Analysis for Linear Systems in transfer function framework; Kharitonov Theorem and extensions
  - Robust Control Systems Design in Frequency Domain; H-infinity Control Theory; Mixed H-2/H-infinity Control
  - Robust Control Design in State Space framework; Robust Quadratic Stabilization via Matching Conditions; Robust Eigenstructure Assignment; Guaranteed Cost Control
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**Designation:**

Elective