AE 556

Robust Control

Instructor:

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Course Outline

This course is an introduction to some of the fundamental topics in Robust Control. The main theme is the development of design criteria and methodologies to handle various types of uncertainties in a control system. Topics include:

- Signal and system spaces. Description of modeling uncertainty.

- Robust stability. The Small Gain Theorem in its various necessary and sufficient forms, and consequences for robust stability.

- Factorization, and the parametrization of all stabilizing controllers and achievable closed loop maps. Optimal design and the associated model matching problem.

- $\mathcal{H}^\infty$-optimal design, ℓ^1-optimal design, Multiobjective design.

- Structured and unstructured uncertainty in control systems. The Robust Performance Problem, the μ-function, and the spectral radius conditions.

Prerequisites : Linear systems theory at a level of ECE 515; basic mathematical background at a level of (at least) MATH 447.

Text: M.A. Dahleh and I.J. Diaz-Bobillo, *Control of Uncertain Systems*, Prentice Hall, 1996.

Meeting Time/ Place : 2:30 PM - 4:20 PM, Tue-Thu room 225 Talbot Laboratory

Credit: 1 unit