

ME 350/450: ADVANCED TOPICS IN CONTROLS

MULTIVARIABLE ROBUST CONTROL

SYLLABUS

https://www.lehigh.edu/~eus204/teaching/ME450_MRC/ME450_MRC.html

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- SISO Systems (Review)
 - Frequency Response
 - Stability, Controllability
 - Closed-loop performance evaluation
 - Loop-shaping
- MIMO Systems
 - Transfer function matrices
 - Smith-McMillan form
 - Poles, zeros, principal gains
 - Operator norms
- Limits of Performance
 - Feedback properties
 - Weighting functions
 - RHP poles/zeros
 - Bode gain/phase
 - Bode's sensivity integral
- Uncertainty Robustness
 - Model Uncertainty
 - LFT's
 - Structured singular value
 - Robust stability & performance
- Design of Robust Controllers
 - H_∞ and μ -synthesis
 - H_∞ loop shaping
- Controller Reduction
 - Balanced realization
 - Optimal Hankel norm reduction
 - Balanced realization in closed form