OFFICIAL SYLLABUS
MATH 563 (same as: ECE 563, ME 563) - Optimal Control Theory

Catalog Description: Description of system and evaluation of its performance; dynamic programming; calculus of variations and Pontryagin's minimum principle; iterative numerical techniques. Prerequisite: MATH 305 or ME 450 or ECE 365.

Textbook: Greg Knowles, *An Introduction to Applied Optimal Control*, Academic Press.

Chapters to be covered:

Chapter I: Examples of Control Systems

Chapter II: The General Linear Time Optimal Problem

Chapter III: The Pontryagin Maximum Principle (including Calculus of Variations)

Chapter IV: The General Maximum Principle Control Problems with Terminal Payoff

Chapter V: Controllability and Observability

Chapter VI: State-Constrained Control Systems

Chapter VII: Dynamic Programming and Differential Games

Additional material on Linear Quadratic optimal control problem and feedback control will be provided.

This course will be based on lectures focused on the theory supplemented by student's presentations of more applied material. Students will be turning in written assignments related to their presentations.