OPUS College of Engineering
MARQUETTE UNIVERSITY

OPTIMAL CONTROL
EECE 6320

Spring-2024
M W 2:00-3:15

This course enables you to design systems which perform optimally based on given specifications such as minimizing the use of energy or fuel, time to respond, steady state accuracy etc. under various equality and inequality constraints.

The techniques presented in this course have been successfully applied thousands of times in diverse areas such as biology, economics, ecology, finance, management, and medicine as well as every engineering discipline from biomedical device design and power electronics to structural design and power systems.

Prerequisite Knowledge: Basic Linear Algebra and State Space Modeling, EECE 6310 Modern Control Theory is preferred, MATLAB

Instructor: Prof. Edwin Yaz
EECE, Marquette University

WHAT YOU WILL LEARN IN THIS COURSE

- ✓ Matrix Calculus
- ✓ Static Optimization with Equality Constraints
- ✓ Dynamic Optimization for Discrete Time System Models
- ✓ Applications to Linear Quadratic Control and Tracking
- ✓ Model Predictive Control
- ✓ Calculus of Variations and Application to Continuous Time Linear Quadratic Control and Tracking
- ✓ Pontryagin's Minimum Principle and Application to Constrained Input, Minimum Time, Minimum Fuel and Minimum Energy Problems
- ✓ Dynamic Programming and Optimal Control with Hamilton-Jacobi-Bellman Equation
- ✓ Differential Games: Nash and Stackelberg Strategies
- ✓ Zero-Sum Games and Application to H-infinity Control
- ✓ Control with Restricted Measurements: Kalman Filter and H-infinity Observer