DIGITAL CONTROL OF DYNAMIC SYSTEMS
3rd Edition, 1998

By Gene F. Franklin, J. David Powell, and Michael Workman

5. Direct Design Method of Ragazzini
8. Design Using State-Space Methods
    1. Control Law Design
    2. Estimator Design
    3. Regulator Design: Control + Estimator
    4. Reference Input
    5. Integral Control and Disturbance Estimation
    6. Effects of Delays
    7. Controllability and Observability
9. Multivariable and Optimal Control
    1. Decoupling
    2. Time-varying Optimal Control
    3. LQR Steady-State Optimal Control
    4. Optimal Estimation
    5. Multivariable Control Design – with Examples
10. Quantization Effects
    1. Analysis of Round-off Errors
    2. Effects of Parameter Round-off
    3. Limit Cycles and Dither
11. Sample Rate Selection
    1. The Sampling Theorem's Limit
    2. Time Response and Smoothness
    3. Errors due to Random Plant Disturbances
    4. Sensitivity to Parameter Variations
    5. Measurement Noise and Antialiasing Filters
    6. Multirate Sampling
12. System Identification (ID)
    1. Defining the Model
    2. ID of Nonparametric Models
    3. Models and Criteria for ID
    4. Deterministic Estimation
    5. Stochastic Least Squares
    6. Maximum Likelihood
    7. Numerical Search for Max Likelihood
    8. Subspace ID Methods
13. Nonlinear Control
    1. Analysis Techniques
    2. Nonlinear Control Structures: Design
    3. Design with Nonlinear Cost Functions

14. Design of a Disk Drive Servo: A Case Study
    1. Overview of Disk Drives
    2. Components and Models
    3. Design Specifications
    4. Disk Servo Design

There is a Summary at the end of each chapter and Problems for the students to work out. There are also Appendices that review basic material, contain a table of z-transforms, and a list of pertinent Matlab Functions.