

Course number and name: ES304 Modern Control Systems

Credits and contact hours: 3-0-3

Course coordinator: CAPT J. W. Nicholson

Text: None

Specific course information:

A study of linear systems modeled as continuous-time state equations. Design and analysis of state feedback control systems. Introduction to state estimation and prediction.

Prerequisites: ES301 and ES303 or ES303H. Coreq: ES308

This is a required course in the Systems Engineering major

Specific goals of the course:

To obtain a state-space model for a particular system, including non-linear systems or systems described by transfer functions.

To obtain zero-state and zero-input system response.

To modify system behavior using state variable feedback and state-plus-integral feedback to meet specific performance specifications.

To design observers to estimate system states.

Topics covered:

Converting transfer functions to state space models

Linearizing non-linear systems and converting to state space models

Zero-input solution

Zero-state solution

State variable feedback and gain computation

Controllability and observability

State plus integral control

Observers, gain computation, response and noise