Course	Name	:	Optimal Control Systems
	Code	:	EE184920
	Credits	:	3
	Semester	:	Elective

Description of Course

The course discusses control system design methods using minimum energy and minimum time criteria. Control issues discussed include regulator and tracking issues using the law of state feedback. In addition, state estimators are also discussed for system design purposes using the law of state feedback if not all states are available or measurable.

Learning Outcomes

Knowledge

(P03) Mastering the concepts and principles of design procedure in power systems, control systems, multimedia telecommunications, or electronics.

Specific Skill

(KK02) Able to describe the completion of engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

General Skill

(KU02) Able to demonstrate independent performance, quality, and measurable.

(KU12) Able to implement information and communication technology (ICT) in the context of implementation of his/her work.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the concept and principle of the optimal control system based on quadratic performance index for regulator and tracking problems.

Specific Skill

Able to solve the optimal control problem for the linear (nonlinear) plant to minimize the quadratic performance index and to design an optimal control system for real plant.

General Skill

Able to do a computer simulation using MATLAB /Simulink.

Attitude

Demonstrating attitude of responsibility on work in his/her field of expertise independently.

Main Subjects

1. Static Optimization
2. The Calculus of Variations
3. Linear Quadratic Regulator
4. Linear Quadratic Tracking
5. State Estimator

6.   Linear Quadratic Minimum-Time

Reference(s)

[1]   Frank L. Lewis, Vassilis L. Syrmos, "Optimal Control," John Wiley & Sons Inc., New York, 1995
[2]   Frank L. Lewis, "Applied Optimal Control and Estimation," PHI, New Jersey, 1992
[3]   Anderson,B.D.O., "Optimal Control: Linear Quadratic Methods," PHI, New Jersey, 1989
[4]   Trihastuti Agustinah, "Diktat Kuliah: Sistem Pengaturan Optimal," Teknik Elektro ITS, 2018

Prerequisite(s)

EE184404 Introduction to Control Systems