COURSE	Name	: Linear Systems Theory
	Code	: EE185121
	Credit(s)	: 3
	Semester	: I

Description of Course

This course discusses the structure and properties of linear systems with an emphasis on the case of single-input single output (SISO) with topics covered include matrix theory, linear vector space, eigenvalue and eigenvector, transition matrix solutions and linear differential equation solutions, state variables equations, properties of controllability and observability and their application, state-feedback-based controller and state observers.

Learning Outcomes

Knowledge

(P01) Mastering the concepts and principles of science in a comprehensive manner, and to develop procedures and strategies needed for the analysis and design of systems related to the field of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics as a preparation for further education or professional career.

Specific Skill

(KK01) Being able to formulate engineering problems with new ideas for the development of technology in power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

General Skill

(KU07) Being able to improve the capacity of learning independently.

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 concepts and principles of linear system theory to develop design procedures needed for linear system analysis and design.

Specific Skill

Able to formulate linear system control in the best control for the linear system.

General Skill

Able to increase learning capacity independently through the design of a linear control system using Matlab/Simulink software.

Attitude

Demonstrating attitude of responsibility on his/her tasks independently and working together on a team to obtain better results.

Main Subjects

1. Mathematical Descriptions of Systems
2. Matrix Algebra
3. State-Space Solutions
4. Stability
5. Controllability and Observability
6. State Feedback Controllers and State Observers

Reference(s)

[1] Chi-Tsong Chen, Linear System Theory and Design, 4th Edition, Oxford University Press, Oxford, UK, 2013
[2] Thomas Kailath, Linear Systems, Prentice-Hall, 1980
[3] Panos J. Antsaklis and Anthony N. Mitchel, Linear Systems, Birkhäuser, 2005

Prerequisite(s)

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