

COURSE	Name : Introduction to Control Systems
	Code : EE184404
	Credits : 3
	Semester : V

Description of Course

Introduction to Control Systems is the underlying subject of control system engineering field of studies. This course discusses how its work, how to design and analyze it. The learning materials as introductory notions is control system components, open loop and closed loop system configurations and examples of its applications. Then forwarded with system modelling of electrical, mechanical and electro-mechanical systems. Furthermore, the important thing is about the block diagram, the signal flow diagram, the system characteristics, response analysis in the time domain and the system stability. Having completed the concept, it also learns about the design of PID controller and its tuning method.

Learning Outcomes

KNOWLEDGE

(P02) Mastering the concepts and principles of engineering and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics.

SPECIFIC SKILL

(KK01) Able to formulate engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

GENERAL SKILL

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

Ability to explain system modelling concepts and principles, stability analysis, determine response specifications and control system design.

SPECIFIC SKILL

Able to model the system, analyze the stability of the system, determine the response specifications and design the control system.

GENERAL SKILL

Able to use Matlab simulation software or the like for analysis and visualization of system responses.

ATTITUDE

Have a passion to improve knowledge in the field of control system to improve the quality of Indonesian society in the mastery of technology.

Main Subjects

1. Definition and concept of control system
2. Dynamic system mathematical model in the form of differential equations, transfer function, block diagram, and graph of signal flow
3. Specification of system response
4. System Stability Analysis
5. Design of PID controller analytically
6. Tuning PID controller with Ziegler-Nichols method
7. Simulation system settings with PID controller Transformation Z

Reference(s)

- [1] Ogata, Katsuhiko: "Modern Control Engineering", 3rd Ed., Prentice-Hall 1997
- [2] Kuo, Benjamin C. "Automatic Control System 8th Ed."
- [3] Jacob, J.M.: "Industrial Control Electronics: Application and Design", PHI 1989

Prerequisite(s)

EE184305 Signals and Systems
