COURSE	Name	: Power Electronic Converters
	Code	: EE185211
	Credit(s)	: 3
	Semester	: II

Description of Course

This course leads students to analyze, model, simulate and design Power Electronics converter with closed loop control. The discussion begins with a review of 4 types of open-loop converters ac-dc, dc-dc, dc-ac, ac-ac. The next discussion about closed loop system and error compensator. Modeling and simulation of closed loop converter using method of Large Signal and Small Signal. Introduction is also given for characteristic observation, analysis and design of converters for power supply applications and control of electric motors.

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

(KU10) Being able to implement the principle of sustainability in developing knowledge.

(KU11) Being able to implement information and communication technology in the context of execution of his/her work.

Attitude

(S06) Working together, having social sensitivity and caring for community and environment.

(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

- Know the technological trends and applications of power electronics converters in electrical systems
- Mastering the power electronics converter system and its main components with closed loop control
- Mastering the characteristics of the power electronics converter that is applied as a conditioner of electric power, power supply, electric motor controller

Specific Skill

- Able to design a closed loop electronics power converter system
- Able to make technical analysis of closed loop power electronics converter device

Main Subjects

1. Trend of technological development of power electronics converter in power system
2. Closed loop system, compensator error: Proportional, Integral, Differential
3. Design of electronic converter power control closed loop
4. Modeling and simulation Power factor correction, active filter
5. Modeling and simulation Uninterruptible Power Supply, Inverter grid connected system
6. Modeling and simulating variable speed drive

Reference(s)

[1] Mochamad Ashari, “Desain Konverter Elektronika Daya”, Penerbit Informatika, Bandung, 2017
[2] Muhammad H. Rashid, “Power Electronics Handbook Devices, Circuits, and Applications”, Third Edition, 2011
[3] Ned Mohan, “Power Electronics”, John Willey and Sons, 2012

Prerequisite(s)

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