

<b>COURSE</b>	Name	: Generator Control System Automation
	Code	: EE185518
	Credit(s)	: 3
	Semester	: (Elective Course)

**Description of Course**

This course discusses about working principle of control and monitoring instrument in generator. The material details includes: voltage control instrument, frequency control instrument, Governor working principle, AGC working principle, Auxiliary control instrument and monitoring instrument in generator.

**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**

(KU01) Being able to develop logical, critical, systematic, and creative thinking through scientific research, the creation of designs or works of art in the field of science and technology which concerns and applies the humanities value in accordance with their field of expertise, prepares scientific conception and result of study based on rules, procedures and scientific ethics in the form of a thesis or other equivalent form, and uploaded on a college page, as well as papers published in scientific journals accredited or accepted in international journals.

**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 of generator automation and monitoring as well as the working principle of generator automation control and instrument.

**Specific Skill**

Able to evaluate the safety conditions of plant operation and able to improve the generator security condition through the performance improvement of its automatic control instrument.

**General Skill**

Able to use software such as matlab simulink and ETAP for simulation of performance evaluation of generator instrument.

### Attitude

Demonstrate a responsible attitude towards the work in the field of Simulation and Analysis of generator security in the power system independently.

### Main Subjects

1. The basic concept of Voltage Control Instrument in generator: The working principle of AVR, AVR circuit, AVR Working Mode. AVR auxiliary instrument.
2. Simulation of Voltage Control with AVR: AVR Modeling. AVR Parameters. Setting AVR parameters. Simulation and evaluation of AVR performance. Improving AVR performance
3. The basic concept of Frequency Control Instrument in Generator: The working principle of Governor and AGC, Governor and AGC circuit, Working Modes of Governor and AGC, Auxiliary instrument of Governor and AGC
4. Frequency Control Simulation with Governor and AGC: Modeling of Governor and AGC, Parameters Governor and AGC, Setting governor and AGC parameters, Simulation and evaluation of governor and AGC performance, improving the performance of Governors and AGCs.
5. Basic Concept of Control and Auxiliary Monitoring Instrument on Generators: Working Principles of Control and Auxiliary Instrument. Auxiliary Control and Monitoring Instrument Circuit. Working Mode of Control and Auxiliary Instrument Monitoring, Control and Monitoring of Auxiliary Instrument
6. Control and Monitoring Simulation of Monitoring and Control Auxiliary Instrument: Modeling Control and Monitoring Instrument. Parameter of Modeling Control and Monitoring Instrument. Setting the parameters of Modeling Control and Monitoring Instrument. Simulation and performance evaluation of Modeling Control and Monitoring Instrument. Improve the performance of Modeling Control and Monitoring Instrument.
7. The basic concept of Parallel generator: The working principle of Parallel Equipment. Parallel Equipment Circuit. Parallel Simulation

### Reference(s)

- [1] Philip Kiameh, "Power Plant Equipment, Operation and Maintenance Guide", McGraw-Hill, 2011
- [2] Adi Soeprijanto, " Analisis Kestabilan Multi generator dengan pendekatan SMIB", Dee Press, 2017
- [3] Paul M Anderson, A.A. Fouad, "Power System Control and Stability, 2nd edition", Wiley-IEEE Press, 2002
- [4] Hadi Saadat, "Power System Analysis", McGraw-Hill Inc, 1999
- [5] Prabha Kundur, "Power System Stability and Control", McGraw-Hill, 1994

### Prerequisite(s)

Power System Analysis