| Course | Name | : | Optimum Operation of Power System |
|--------|------|---|-----------------------------------|
|        | Code | : | EE184910 |
|        | Credits | : | 3 |
|        | Semester | : | Elective |

## Description of Course

The optimal course of operating the electric power system addresses the topic of optimal scheduling and loading of the economy. Optimal loading of plants is carried out by considering the limits of primary energy supply and network constraints such as channel voltage and capacity. In addition, this course also discusses coordination between thermal and hydro power plants in supplying loads. Some conventional methods and smart methods are introduced to solve problems.

## 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

(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 of loading and generating electricity optimum scheduling.

### Specific Skill

Able to analyze load requirements and arrange loading and scheduling of generating units.

### General Skill

Able to use Matlab / Powergen software to analyze load requirements, loading and scheduling generating units.

### Attitude

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

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

## Main Subjects

1. The purpose of the analysis of the reliability of the electric power system (STL). Overview of the Java Bali interconnection system. Planning for STL operations at PLN P3B. Reliability standards in Indonesia. Heat rate curve, fuel price, calorie content in fuel

2. Economic dispatch formula without losses, Lagrange equation, Analytical method, Lambda iteration method
3. Economic dispatch with base point and participation factor.
4. The Economic Dispatch considers the ramp rate or called Dynamic Economic Dispatch.
5. Matrix of channel losses, Bmn
6. Economic dispatch formula with channel losses, Lagrange equation, lambda iteration method
7. Economic dispatch for continuous cost functions.
8. Economic dispatch dynamic calculations and calculations.
9. Spinning reserve, limitation of thermal units. Formula unit commitment. Priority list method, Dynamic Programming Method.

## Reference(s)

[1]  Power Generation Operation and Control (Allen J. Wood & Bruce F. Wollenberg), 2014
[2]  Power System Analysis (Hadi Saadat)

## Prerequisite(s)

EE184511 Power System Analysis