

Electric Power System

2 units (selection)

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Target) The electric power system becomes the attractive technical field recently from the viewpoints such as effective utilization of energy and emission reduction of the carbon dioxide in addition to the viewpoints such as stable supply of electric energy. In this lecture, the understanding of traditional technical contents as the power transmission and distribution of electrical energy is the objective of beginning. The second objective is the understanding of smart grid and its latest surrounding technology. The smart grid is an upcoming technology in fusing a wide range of technical fields. Also, this lecture expands knowledge about the energy transmission technology except the electric power field. The other objective is the understanding usage of electric and electronic circuit analysis program: EMTP which is more used for the analysis of electric power system.

Outline) From the viewpoints as the effective utilization with energy, the technical contents about the power transmission and distribution of electric energy will be described at first. The next is the learning about the smart grid. It consists of not only the learning about the smart grid but also the understanding the present state and problems of existing power-network, the trend of the dispersed power source and the characteristics and the latest trend of the energy storage equipment. Also, the energy transmission technology except the electric power fields, too, will be described. Finally, we will have a practice to use the electric and electronic circuit analysis program: EMTP, which is more used for the analysis of the electric power system. The learning is efficiently done with making reports, presentations and moreover the practice.

Keyword) *electrical power engineering, transmission and distribution of electric power, smart grid*

Goal)

1. The principle of the transmission and distribution technology can be understood for the efficient electric power transportation.
2. Smart grid and the surrounding technology can be understood
3. The electric and electronic circuit analysis program: EMTP can be used for the primary subject

Schedule)

1. Overview and Introduction of the electric power system theory

2. The history of electric energy

3. Voltage drop of power transmission and distribution line

4. Power transmission-and-distribution line and power factor of load

5. Smart grid power system

6. Technologies to support smart grid

7. Presenting the report about the smart grid power system: 1

8. Presenting the report about the smart grid power system: 2

9. Presenting the report about the smart grid power system: 3

10. Presenting the report about the smart grid power system: 4

11. EMTP: the electric and electronic circuit analysis program

12. Report about using EMTP: 1

13. Report about using EMTP: 2

14. Report about using EMTP: 3

15. Final examination

16. Conclusions

Evaluation Criteria) The score is evaluated with total point of presentation:30%, report:30% and examination:40%. The evaluation of pass is more than 60% of total point.

Contents) <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216793>

Contact)

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