

Power Energy Conversion and Control Engineering

2 units (selection)

Tokuo Ohnishi · PROFESSOR / ELECTRIC ENERGY ENGINEERING, ELECTRICAL AND ELECTRONIC ENGINEERING, SYSTEMS INNOVATION ENGINEERING

Target) To investigate and learn new energy conversion and control technologies in the fields of the electric power system and the renewable energy.

Outline) Power electronics technologies in utility interconnection systems such as HVDC (High-Voltage Direct-Current) transmission system, SVG (Static Var Generator), UPS (Uninterruptible Power Supply) and FACTS (Flexible AC Transmission System) and in renewable energy development system such as photovoltaic, wind and fuel cell power generation system.

Keyword) *energy conversion, energy control, utility interconnection control system, renewable energy*

Fundamental Lecture) “Advanced Power Electronics”(0.5)

Relational Lecture) “Advanced Theory of Electric Power Control Systems” (0.5), “Semiconductor Device Physics”(0.5)

Requirement) Prerequisites: It is preferable to have knowledge equal with power electronics in undergraduate and advanced power electronics in masters degree course.

Goal)

1. State of the Arts and Trends of The Utility Interconnection System using Power Electronics Technology
2. State of The Arts and Trends of The Renewable Energy Development using Power Electronics Technology

Schedule)

1. Introduction of Power Electronics Technology in Utility Interconnection System
2. High Voltage Direct Current Transmission System
3. Flexible AC Transmission System
4. Static Var Generator
5. Unified Power Flow Controller
6. Uninterruptible Power Supply
7. Introduction of Power Electronics Technology in Renewable Energy
8. Photovoltaic Power Generation System
9. Wind Power Generation System
10. Micro Gas Turbine System
11. Fuel Cell System

12. Charging and Discharging System for DC Battery

13. Hybrid Power Supply System

14. Distributed Generation System

15. Discussion for Reports

Evaluation Criteria) Report and presentation

Contents) <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216815>

Contact)

⇒ Ohnishi (E 棟 2 階北 B-1, +81-88-656-7456, ohnishi@ee.tokushima-u.ac.jp)
p) MAIL