

|               |           |                     |
|---------------|-----------|---------------------|
| <b>COURSE</b> | Name      | : Power Electronics |
|               | Code      | : EE185713          |
|               | Credit(s) | : 2                 |
|               | Semester  | : (Elective Course) |

### Description of Course

This course provides an overview of the role of electronic (power electronics) based energy conversion in the electricity system.

### 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

- Knowing the applications and needs of an electronic energy-based conversion system in the scope of the electricity system and society in general.
- Knowing energy conversion devices and their main components.

#### Specific Skill

- Able to design energy conversion systems.
- Able to make technical analysis of energy conversion devices.

---

### Main Subjects

---

1. Scope of the electricity system, needs and use of energy conversion devices
2. Semiconductor switch: diode, thyristor, transistor
3. Combination circuit R, L, C with a dc and ac voltage switch and source
4. Converters from:
  - AC to DC, wave ripple, leveling filter
  - dc to dc, wave ripple
  - DC to AC, harmonics, passive filters
  - AC to AC, topology
5. Uninterruptible power supply system, variable speed drive, harmonic filter

---

### 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)

---

--

---