Mata Kuliah ***Course***	Nama MK *Name*	:	Elektronika Daya *Power Electronics*
	Kode MK *Code*	:	EE184611
	Kredit *Credits*	:	3 sks
	Semester *Semester*	:	VI (Wajib) *VI (Compulsory)*
	Beban Belajar *Workload*	:	Kuliah : 3 x 50 = 150 menit/minggu Latihan/tugas : 3 x 60 = 180 menit/minggu Belajar mandiri : 3 x 60 = 180 menit/minggu *Lectures : 3 x 50 = 150 min/week* *Exercises/Assignments : 3 x 60 = 180 min/week* *Self learning : 3 x 60 = 180 min/week*
	Tingkatan *Module Level*	:	Sarjana (S1) *Undergraduate*
	Penanggung Jawab *PIC*	:	Heri Suryoatmojo, ST, MT, PhD
	Pengajar *Lecturer*	:	Heri Suryoatmojo, ST, MT, PhD Prof.Dr.Ir. Mochamad Ashari, M.Eng
	Bahasa *Language*	:	Bahasa Indonesia and English
	Persyaratan dan Peraturan *Requirement and Regulation*	:	Setiap mahasiswa harus menghadiri setidaknya 75% dari jumlah perkuliahan untuk dapat mengikuti ujian *A student must have attended at least 75% of the lectures to sit in the exams*

Deskripsi Mata Kuliah
Description of Course

Mata kuliah ini memberikan gambaran tentang peran pengkonversian energi berbasis elektronik (elektronika daya) dalam sistem ketenagalistrikan.

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

CPL Prodi yang Dibebankan
Learning Outcomes

(CPL-03) Mampu mendesain komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi

(PLO-3) Capable to design logical and realistic components, systems and processes in accordance with specified specifications by considering safety, social, cultural, environmental and economic aspects

(CPL-05) Mampu mengidentifikasi, memformulasikan dan menyelesaikan permasalahan dibidang teknik elektro

(PLO-5)Capable to identify, formulate and solve problems in the field of electrical engineering

(CPL-11) Mampu menerapkan metode, ICT, dan perangkat modern dalam penyelesaian permasalahan dibidang teknik elektro

(PLO-11) Capable to apply methods, ICT, and modern devices in solving problems in the field of electrical engineering

Capaian Pembelajaran Mata Kuliah

Course Learning Outcomes

(CPMK-01) Mengetahui aplikasi dan kebutuhan sistem pengkonversi energi berbasis elektronik di lingkup sistem ketenaga-listrikan maupun masyarakat secara umum.
(CLO-01) Knowing the application and requirements of electronic-based energy conversion systems in the scope of electricity systems and society in general.

(CPMK-02) Mengetahui perangkat pengkonversi energi beserta komponen utamanya.
(CLO-02) Knowing the energy conversion device and its main components.

(CPMK-03) Mampu membuat desain sistem pengkonversi energi.
(CLO-03) Able to design energy conversion systems.

(CPMK-04) Mampu membuat analisis teknis terhadap perangkat pengkonversi energi.
(CLO-04) Able to make technical analysis of energy conversion devices.

Topik/Pokok Bahasan

Main Subjects

1. Lingkup sistem ketenaga-listrikan, kebutuhan dan penggunaan perangkat pengkonversi energi
   Scope of the electricity system, needs and use of energy conversion devices
2. Saklar semikonduktor: diode, thyristor, transistor
   Semiconductor switch: diode, thyristor, transistor
3. Rangkaian kombinasi R, L, C dengan saklar dan sumber tegangan DC dan AC
   A series of combinations R, L, C with a switch and a dc and ac voltage source
4. Rangkaian pengkonversi dari :
   - AC ke DC, riak gelombang, filter perata
     AC to DC, wave ripples, level filters
   - DC ke DC, riak gelombang
     DC to DC, wave ripples
   - DC ke DC, harmonik, filter pasif
     DC to AC, harmonics, passive filters
   - DC ke AC, topologi
     AC to AC, topology
5. Sistem uninterruptible power supply, variable speed drive, filter harmonik
   Uninterruptible power supply system, variable speed drive, harmonic filter

Pembelajaran dan ujian

Study and examination

- Latihan di kelas
  In-class exercises
- Tugas 1, 2, 3

Assignment 1, 2, 3

- Ujian tengah semester
  Mid-term examination
- Ujian akhir semester
  Final examination

Pustaka

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

Prasyarat

Prerequisite(s)

- EE184306 Rangkaian Elektronika
  EE184306 Electronic Circuits
- EE184303 Medan Elektromagnetik
  EE184303 Electromagnetic Fields