	INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS) **FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS** **DEPARTEMEN TEKNIK ELEKTRO** **Program Studi Sarjana (S1) Teknik Elektro** ***INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)*** ***FACULTY OF INTELLIGENT ELECTRICAL & INFORMATICS TECHNOLOGY*** ***DEPARTMENT OF ELECTRICAL ENGINEERING*** ***Bachelor Degree Program in Electrical Engineering***

1	**Nama Mata Kuliah / *Course Name***	:	Pengendalian Kestabilan Sistem Tenaga Listrik / *Power System Stability and Control*
2	**Kode Mata Kuliah / *Course Code***	:	EE234713
3	**Kredit / *Credits***	:	3 SKS
4	**Semester / *Semester***	:	0

Deskripsi Mata Kuliah / *Course Description*

MK ini membantu mahasiswa memahami pentingnya dasar-dasar kestabilan sistem tenaga listrik. Secara umum, mahasiswa diajak untuk berdiskusi mengenai pemodelan sistem tenaga listrik beserta pengendalinya. Secara khusus, mahasiswa akan memodelkan pengendalian kestabilan tegangan, frekuensi, dan daya listrik. / *This course helps students understand the importance of the fundamentals of stability in power systems. In general, students are encouraged to discuss the modeling of power systems and their controls. Specifically, students will model the control of voltage, frequency, and power stability.*

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / *Program Learning Outcomes Charged to The Course*

CPL 1	Mampu menunjukkan sikap dan karakter yang mencerminkan: ketakwaan kepada Tuhan Yang Maha Esa, etika dan integritas, berbudi pekerti luhur, peka dan peduli terhadap masalah sosial dan lingkungan, menghargai perbedaan budaya dan kemajemukan, menjunjung tinggi penegakan hukum mendahulukan kepentingan bangsa dan masyarakat luas, melalui kreatifitas dan inovasi, ekselensi, kepemimpinan yang kuat, sinergi, dan potensi lain yang dimiliki untuk mencapai hasil yang maksimal / *Being able to demonstrate attitudes and characteristics that reflect: devotion to the One Almighty God, ethics and integrity, noble virtues, sensitivity and care towards social and environmental issues, appreciation of cultural diversity and inclusivity, upholding the rule of law with a priority on the interests of the nation and the wider community, through*

creativity and innovation, excellence, strong leadership, synergy, and other potentials possessed to achieve maximum results.

CPL 2 Mampu mengkaji dan memanfaatkan ilmu pengetahuan dan teknologi dalam rangka mengaplikasikannya pada bidang teknik elektro, serta mampu mengambil keputusan secara tepat dari hasil kerja sendiri maupun kerja kelompok dalam bentuk laporan tugas akhir atau bentuk kegiatan pembelajaran lain yang luarannya setara dengan tugas akhir melalui pemikiran logis, kritis, sistematis dan inovatif / *Able to examine and utilize knowledge and technology for the purpose of applying them in the field of electrical engineering, and making informed decisions based on individual work as well as group work in the form of final reports or other learning activities whose outcomes are equivalent to final projects, through logical, critical, systematic, and innovative thinking.*

CPL 3 Mampu mengelola pembelajaran diri sendiri, dan mengembangkan diri sebagai pribadi pembelajar sepanjang hayat untuk bersaing di tingkat nasional, maupun internasional, dalam rangka berkontribusi nyata untuk menyelesaikan masalah dengan mengimplementasikan teknologi informasi dan komunikasi dan memperhatikan prinsip keberlanjutan serta memahami kewirausahaan berbasis teknologi / *Able to manage one's own learning and continually self-develop as a lifelong learner to compete at the national and international levels, with the goal of making a tangible contribution to problem-solving by implementing information and communication technology and considering sustainability principles, as well as understanding technology-based entrepreneurship.*

Capaian Pembelajaran Mata Kuliah / *Course Learning Outcomes*

1. Mahasiswa dapat memahami dasar sistem pengendalian tenaga listrik */ Students can understand the fundamentals of electric power control systems.*
2. Mahasiswa dapat memahami dasar kestabilan sistem tenaga listrik / *Students can comprehend the basics of electric power system stability.*
3. Mahasiswa dapat membuat model simulasi sistem tenaga listrik / *Students can create simulation models of electric power systems.*
4. Mahasiswa dapat membuat model simulasi pengendali sistem tenaga listrik / *Students can create simulation models of control systems for electric power systems.*
5. Mahasiswa dapat melakukan asesmen terhadap performansi kestabilan sistem tenaga listrik / *Students can assess the performance of electric power system stability.*
6. Mahasiswa dapat membuat model simulasi pengendalian kestabilan frekuensi / *Students can create simulation models for frequency stability control.*
7. Mahasiswa dapat membuat model simulasi pengendalian kestabilan tegangan dan daya listrik / *Students can create simulation models for voltage and power stability control.*

Pokok Bahasan / *Contents*

1. Dasar Sistem Pengendalian Tenaga Listrik / *Fundamentals of Power System Control*
2. Dasar Kestabilan Sistem Tenaga Listrik / *Basics of Power System Stability*
3. Pemodelan Sistem Tenaga Listrik / *Modeling of Power Systems*

4. Pemodelan Pengendali Sistem Tenaga Listrik / *Modeling of Power System Controllers*
5. Asesmen Performansi Kestabilan Sistem Tenaga Listrik / *Assessment of Power System Stability Performance*
6. Pengendalian Kestabilan Frekuensi / *Frequency Stability Control*
7. Pengendalian Kestabilan Tegangan dan Daya Listrik / *Voltage and Power Stability Control*

Prasyarat / *Pre-requisite*

Pustaka / *Reference*

1. Imam Robandi, Modern Power System Control, Penerbit Andi, Yogyakarta, 2009
2. Prabha Kundur, Power System Stability and Control, McGraw Hill, 2nd edition, 2022
3. Peter W. Sauner & M.A. Pai, Power System Dynamics and Stability, Dept. of Electrical and Computer Engineering, The Univ. of Illinois, 2008
4. Abdelhay A. Sallam, Om P. Malik, Power System Stability: Modelling, Analysis and Control, IET Power and Energy Series, 2015
5. Fuad & Anderson, Power System Control and Stability, Wiley-IEEE Press, 2003