



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS
DEPARTEMEN TEKNIK ELEKTRO
Program Studi Magister (S2) Teknik Elektro

1	Nama Mata Kuliah / <i>Course Name</i>	: Kestabilan dan Kendali Sistem Tenaga Listrik / <i>Stability and Control of Electric Power System</i>
2	Course Code	: EE255218
3	Kredit / Credits	: 3 SKS
4	Semester / Semester	: 1

Deskripsi Mata Kuliah / Course Description

MK ini mendiskusikan dasar stabilitas dan pengendaliannya pada Sistem Tenaga Listrik. Mahasiswa diharapkan dapat memodelkan STL beserta pengendalinya mulai dari metode konvensional hingga terbaru.

This MK discusses the basics of stability and its control in the Electric Power System. Students are expected to be able to model STL and its controllers starting from conventional to the latest methods.

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

1. (CPL-02) Mampu mengembangkan dan memecahkan permasalahan ipteks dalam bidang keilmuannya melalui riset dengan pendekatan inter atau multidisiplin hingga menghasilkan karya inovatif dan teruji, serta mendapat pengakuan nasional dan internasional.

(PLO-02) Able to develop and solve science and technology problems in their scientific fields through research with an inter or multidisciplinary approach to produce innovative and tested work, and receive national and international recognition.
2. (CPL-03) 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 memperhatikan prinsip keberlanjutan.

(PLO-03) Able to manage self-learning, and develop oneself as a lifelong learner to compete at national and international levels, in order to make a real contribution to solving problems while paying attention to the principle of sustainability.
3. (CPL-04) Mampu menguasai konsep, prinsip keilmuan secara komprehensif, prinsip rekayasa, dan pengetahuan faktual tentang Teknologi Informasi untuk mengembangkan prosedur dan strategi yang diperlukan pada analisis dan perancangan sistem terkait bidang Teknik Elektro.

(PLO-04) Able to master concepts, scientific principles comprehensively, engineering principles, and factual knowledge about Information Technology to develop procedures and strategies required in the analysis and design of systems related to the field of Electrical Engineering.

Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes
1. Mahasiswa memahami Dasar Kestabilan Dinamik / <i>Students understand the Basics of Dynamic Stability</i> 2. Mahasiswa memahami Kestabilan Dinamik pada Sistem Mesin Tunggal / <i>Students understand Dynamic Stability in Single Machine Systems</i> 3. Mahasiswa memahami Pengendalian Adaptif untuk Frekuensi dan Tegangan pada Sistem Pembangkit / <i>Students understand Adaptive Control for Frequency and Voltage in Generating Systems</i> 4. Mahasiswa memahami Pengendalian Stabilitas dan Daya melalui Penalaan Cerdas Peralatan Elektronika Daya / <i>Students understand Stability and Power Control through Intelligent Tuning of Power Electronic Equipment</i> 5. Mahasiswa memahami Pengendalian Sistem Tenaga Listrik Sistem Interkoneksi Skala Besar / <i>Students understand the Control of Large-Scale Interconnected Power Systems</i> 6. Mahasiswa memahami Pengendalian dan Pengoperasian Sistem Energi Terbarukan / <i>Students understand the Control and Operation of Renewable Energy Systems</i> 7. Mahasiswa memahami Sistem Kendali Cerdas pada Kendaraan Listrik / <i>Students understand the Intelligent Control System in Electric Vehicles</i>
Pokok Bahasan / Contents
1. Dasar Kestabilan Dinamik / <i>Basics of Dynamic Stability</i> 2. Kestabilan Dinamik pada Sistem Mesin Tunggal / <i>Dynamic Stability in Single Machine Systems</i> 3. Pengendalian Adaptif untuk Frekuensi dan Tegangan pada Sistem Pembangkit / <i>Adaptive Control for Frequency and Voltage in Generating Systems</i> 4. Pengendalian Stabilitas dan Daya melalui Penalaan Cerdas Peralatan Elektronika Daya / <i>Stability and Power Control through Intelligent Tuning of Power Electronic Equipment</i> 5. Pengendalian Sistem Tenaga Listrik Sistem Interkoneksi Skala Besar / <i>Large Scale Interconnected Power System Control</i> 6. Pengendalian dan Pengoperasian Sistem Energi Terbarukan / <i>Control and Operation of Renewable Energy Systems</i> 7. Sistem Kendali Cerdas pada Kendaraan Listrik / <i>Intelligent Control System in Electric Vehicles</i>
Prasyarat / Pre-requisite
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Pustaka / Reference
Utama / <i>Primary:</i> 1. Imam Robandi, Modern Power System Control, Penerbit Andi, Yogyakarta, 2009 2. Fuad & Anderson, Power System Control and Stability, Wiley-IEEE Press, 2003 3. Prabha Kundur, Power System Stability and Control, McGraw Hill, 2nd edition, 2022 Pendukung / <i>Supporting:</i> 4. Peter W. Sauner & M.A. Pai, Power System Dynamics and Stability, Dept. of Electrical and Computer Engineering, Univ. of Illinois, 2008 5. Abdelhay A. Sallam, Om P. Malik, Power System Stability: Modelling, Analysis and Control, IET Power and Energy Series, 2015 6. Mohamed A. & Ali Mohamed, Modeling and Simulation of Smart Grid Integrated with Hybrid Renewable Energy Systems, Springer, 2018

7. Amir Taghavipour, et al., Intelligent Control of Connected Plug-in Hybrid Electric Vehicles, Springer, 2019