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***	:	Transmisi dan Distribusi / *Electric Power Transmission and Distribution*
2	**Kode Mata Kuliah / *Course Code***	:	EE234711
3	**Kredit / *Credits***	:	4 SKS
4	**Semester / *Semester***	:	7

Deskripsi Mata Kuliah / *Course Description*

Mata kuliah Transmisi dan Distribusi membahas tentang sistem transmisi dan distribusi kelistrikan secara menyeluruh.

Materi sistem transmisi membahas unjuk kerja dari sistem transmisi panjang, menengah, dan pendek. Parameter unjuk kerja adalah drop tegangan. Perameter mekanis pada sistem transmisi seperti sagging, jenis tower.

Materi Distribusi membahas desain sistem distribusi tenaga listrik baik distribusi primer maupun sekunder, dan permasalahan pada sistem distribusi listrik yang meliputi operasi, stabilitas tegangan, dan rugi - rugi pada sistem tenaga listrik. / *The Transmission and Distribution course comprehensively covers electrical transmission and distribution systems. The transmission system segment discusses the performance of long, medium, and short transmission systems, with a focus on voltage drop as a performance indicator. Mechanical parameters in transmission systems such as sagging and tower types are also discussed. The distribution segment covers the design of electrical power distribution systems, both in the primary and secondary distribution networks. It addresses issues related to the distribution system, including operations, voltage stability, and power losses.*

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

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.*

CPL 6 Mampu mengkaji dan memanfaatkan matematika, ilmu pengetahuan alam dan teknologi serta mengidentifikasi, memformulasikan dan menyelesaikan permasalahan di bidang teknik elektro / *Able to evaluate and utilize mathematics, natural sciences, and technology, as well as identify, formulate, and solve problems in the field of electrical engineering.*

Capaian Pembelajaran Mata Kuliah / *Course Learning Outcomes*

1. Mahasiswa menguasai konsep dan prinsip sistem transmisi AC , DC, transmisi bawah tanah dan sistem distribusi dengan segala peralatan tenaga listrik yang melekat / *Students have a good grasp of the concepts and principles of AC and DC transmission systems, underground transmission, and distribution systems, including all associated electrical equipment.*
2. Mahasiswa mampu menghitung besaran-besaran sistem transmisi dan sistem distribusi. / *Students are capable of calculating the parameters of transmission and distribution systems.*
3. Mahasiswa menguasai prinsip kerja peralatan pada sistem transmisi dan sistem distribusi. / *Students have a solid understanding of the operating principles of equipment in transmission and distribution systems.*
4. Mahasiswa mampu menggunakan software untuk menghitung parameter dan untuk menilai unjuk kerja sistem transmisi dan distribusi. / *Students can utilize software to calculate parameters and evaluate the performance of transmission and distribution systems.*

Pokok Bahasan / *Contents*

1. Perencanaan sistem transmisi / *Transmission System Planning*
2. Overhead Power Transmission
3. Parameter Saluran: Resistansi / *Channel Parameters: Resistance*

4. Parameters: Resistance
5. Parameter Saluran : Induktansi, GMR, GMD Parameters: Inductance, GMR, GMD / *Channel Parameters: Inductance, GMR, GMD*
6. Parameter Saluran : Kapasitansi / *Parameters: Capacitance*
7. Pemodelan Saluran : Pendek, Menengah, Panjang / *Channel Modeling: Short, Medium, Long*
8. Sistem transmisi HVDC termasuk penggunaan kabel bawah tanah / *HVDC Transmission System, including Underground Cable Usage*
9. Analisa Sag dan Tension / *Sag and Tension Analysis*
10. Pendahuluan Sistem Distribusi, Perencanaan saluran subtransmisi dan GI Distribusi / *Introduction to Distribution Systems, Subtransmission Line Planning, and Distribution Grid Planning*
11. Gardu Induk Distribusi dan Peralatan Pengaman pada system disrtribusi / *Distribution Substation and Protection Equipment in Distribution Systems*
12. Karakteristik Beban Sistem Distribusi / *Distribution System Load Characteristics*
13. Perhitungan aliran daya, perhitungan drop tegangan, rugi-rugi, power faktor dan keandalan pada sistem distribusi / *Power Flow Calculation, Voltage Drop Calculation, Losses, Power Factor, and Reliability in Distribution Systems*

Prasyarat / *Pre-requisite*

Analisis Sistem Tenaga, Teknik Tegangan Tinggi / *Power System Analysis, High Voltage Engineering*

Pustaka / *Reference*

1. J.J. Granger, W.D. Stevenson, ”Power System Analysis”, John Wiley, New York, 1994
2. Turan Gonen, “Electrical Power System Transmission Engineering: Anaysis dan Desain”, CRC Press, Third Edition, 2014
3. “ ABB Swtichgear Manual”, Cornelsen Verlag, Berlin, 10th revised edition, Berlin, 2004
4. John D. McDonald (Editor), Electric Power Substations Engineering”, CRC Press, Third Edition, 2012
5. Westinghouse Electric Corporation, Distribution Systems
6. Irwin Lazar, Sistem Kelistrikan Industri
7. Electric Power Distribution Handbook, T.A. Short
8. William H. Kersting, Distribution System Modeling and Analysis,