INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)

FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS

DEPARTEMEN TEKNIK ELEKTRO

Program Studi Sarjana (S1) Teknik Telekomunikasi

1	**Nama Mata Kuliah / Course Name**	:	Jaringan Komunikasi Data / *Data Communication Network*
2	**Kode Mata Kuliah / Course Code**	:	EL234304
3	**Kredit / Credits**	:	3
4	**Semester / Semester**	:	3

Deskripsi Mata Kuliah / Course Description

Mata kuliah Jaringan Komunikasi Data ini bertujuan untuk memberi gambaran dasar terkait model sistem komunikasi data dan aturan-aturan yang harus diikuti agar memungkinkan terjadi pengiriman informasi digital dari sisi pengirim ke sisi penerima. Secara umum, mata kuliah ini membahas tentang konsep dasar komunikasi data, macam-macam protokol yang bisa diikuti, protokol jaringan internet (TCP/IP) dan sistem kerjanya, gangguan komunikasi data dan kinerja sistem jaringan komunikasi data. Pada bagian akhir juga diperkenalkan konsep pengalamatan IP, pengelompokan kelas IP dan melakukan praktek setting IP menggunakan perangkan sistem telekomunikasi yang ada di Lab. Jaringan Telekomunikasi.

This Data Communications Networks course aims to provide a basic description regarding data communication system models and the rules that must be followed in order to enable the transmission of digital information from the sending side to the receiving side. In general, this course discusses the basic concepts of data communication, various protocols that can be followed, internet network protocols (TCP/IP) and their working systems, data communication disruptions and data communication network system performance. In the final section, the concept of IP addressing, IP class grouping and practical IP settings are introduced using telecommunications system devices in the Lab. Telecommunications Network.

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

1. (CPL-05) 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-05) *Able to design components, systems, and/or processes to meet desired needs within realistic constraints in such aspects as law, economic, environment, social, politics, health and safety, sustainability as well as to recognize and/or utilize the potential of local and national resources with global perspective*.

2. (CPL-07) Mampu mengidentifikasi, memformulasikan, menganalisis, dan menyelesaikan permasalahan kompleks di bidang teknik telekomunikasi.
   (PLO-07) *Able to identify, formulate, analyze, and solve the complex problems in the field of Telecommunication Engineering*
3. (CPL-08) Mampu mengetahui dan mengaplikasi metode dan keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan di bidang Teknik Telekomunikasi dengan mengedepankan nilai-nilai universal
   (PLO-08) *Able to know and apply methods, skills according to the latest developments in the field of science and technology to solve electrical engineering problems by prioritizing universal values.*

Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes

1. Mampu menjelaskan konsep sistem komunikasi data dan jaringan komunikasi data. / *Be able to explain the concept of data communication systems and data communication networks.*
2. Mampu memahami fungsi protokol jaringan dan berbagai jenis protokol komunikasi data./ *Able to understand the functions of network protocols and various types of data communication protocols.*
3. Mampu memahami sistem deteksi error & sistem kendali kesalahan data / *Able to understand error detection system & data error control system*
4. Mampu memahami konsep jaringan internet (TCP/IP) dan sistem kerjanya / *Able to understand the concept of internet network (TCP/IP) and its working system*.
5. Mampu mengidentifikasi potensi gangguan pada jaringan komunikasi data, perhitungan performansi, pengukuran QoS dan memahami keandalan jaringan. / *Be able to identify potential disturbances in data communication networks, calculate performance, measure QoS and understand network reliability.*
6. Mampu memahami konsep IP, berbagai jenis kelas IP dan praktek setting IP menggunakan perangkat telekomunikasi real / *Able to understand the concept of IP, various types of IP classes and IP setting practices using real telecommunications devices.*

Pokok Bahasan / Contents

1. Konsep Dasar Sistem Komunikasi Data / *Basic Concepts of Data Communication Systems*
2. Jaringan Komunikasi Data, Topologi dan Klasifikasinya / *Data Communication Network, Topology and Classification*
3. Berbagai Protokol Komunikasi Data / *Various Data Communication Protocols*
4. Model Protokol Komunikasi Data Standar (OSI-Layer) / *Standard Data Communication Protocol Model (OSI-Layer)*

5. Konsep Deteksi Kesalahan & Koreksi Kesalahan */ Concept of Error Detection & Error Correction*
6. Kendali Aliran Data & Kendali Kesalahan / *Data Flow Control & Error Control*
7. Protokol Jaringan Internet (TCP/IP) / *Internet Network Protocol (TCP/IP)*
8. Jenis Gangguan & Kinerja Jaringan Komunikasi Data / *Types of Interference and Data Communication Network Performance*
9. Sistem Pengalamatan IP & Jenis Klasifikasinya */ IP Addressing System and Classification Types*
10. Praktek setting IP pada perangkat sistem telekomunikasi / *IP setting practice on telecommunications system devices*

Prasyarat / Pre-requisite

Pengantar Teknik Telekomunikasi / *Introduction to Telecommunication Engineering*

Pustaka / Reference

Utama :

1. William Stallings, “Data and Computer Communications”, 10-th ed., Prentice Hall Pearson Education, 2014.
2. Douglas Comer, “Internetworking with TCP/IP:Principles, Protocols, and Architectures “, 4th ed., Prentice Hall, 2000.
3. Walter Goralski, “The Illustrated Network How TCP/IP Works in a Modern Network”, 2-nd Edition, Morgan Kaufmann Publisher (imprint of Elsevier), 2017.

Pendukung :

1. Behrouz A. Forouzan, “TCP/IP Protocol Suite”, 4th ed., McGraw-Hill, New York, 2010.
2. R. Hinden, S. Deering, “Internet Protocol Version 6 (IPv6) Addressing Architecture”, RFC 4291, April 2003.