

Mata Kuliah Course	Nama MK <i>Name</i>	: Dasar Sistem dan Jaringan Telekomunikasi <i>Introduction to Telecommunication Systems and Networks</i>
	Kode MK <i>Code</i>	: EE184302
	Kredit <i>Credits</i>	: 3 sks
	Semester <i>Semester</i>	: III (Wajib) <i>III (Compulsory)</i>
	Beban Belajar <i>Workload</i>	: Kuliah : 3 x 50 = 150 menit/minggu Latihan/tugas : 3 x 60 = 180 menit/minggu Belajar mandiri : 3 x 60 = 180 menit/minggu <i>Lectures : 3 x 50 = 150 min/week Exercises/Assignments : 3 x 60 = 180 min/week Self learning : 3 x 60 = 180 min/week</i>
	Tingkatan <i>Module Level</i>	: Sarjana (S1) <i>Undergraduate</i>
	Penanggung Jawab <i>PIC</i>	: Ir. Gatot Kusrahardjo, MT
	Pengajar <i>Lecturer</i>	: Ir. Gatot Kusrahardjo, MT Dr. Prasetiyono Hari Mukti, ST, M.Sc
	Bahasa <i>Language</i>	: Bahasa Indonesia dan Bahasa Inggris <i>Bahasa Indonesia and English</i>
	Persyaratan dan Peraturan <i>Requirement and Regulation</i>	: Setiap mahasiswa harus menghadiri setidaknya 75% dari jumlah perkuliahan untuk dapat mengikuti ujian <i>A student must have attended at least 75% of the lectures to sit in the exams</i>

Deskripsi Mata Kuliah

Description of Course

Mata Kuliah Dasar Sistem dan Jaringan Telekomunikasi membahas tentang konsep dasar Sistem Telekomunikasi dan Jaringan Data secara umum. Bagian awal mempelajari komponen dasar, klasifikasi sistem, jenis sinyal informasi, jenis medium transmisi dan berbagai macam teknik modulasi. Pada sistem nirkabel (wireless), membahas klasifikasi Spektrum Frekuensi Radio dan propagasinya, serta fungsi antenna & satelit. Untuk memberi gambaran komunikasi suara, diperkenalkan Sistem Teleponi, trafik Erlang dan teknik multipleksing. Sedangkan pada bagian transmisi data, mengambil bahasan perihal konsep jaringan, protokol jaringan, sistem internet (TCP/IP) dan proses-proses yang terjadi dalam tiap lapis jaringan. Di bagian akhir, mempelajari berbagai gangguan dan pengaruhnya dalam performansi sistem dan jaringan telekomunikasi.

This course discusses basic concepts of Telecommunications Systems and Data Networks in general. It begins with study on basic components, system classification, type of information signal, type of transmission medium and various modulation techniques. Wireless system part discusses radio frequency spectrum classification and its propagation, as well as antenna & satellite functions. To give an overview of voice communication, Telephony Systems, Erlang traffic and multiplexing

techniques are introduced. Concept of networks, network protocols, internet systems (TCP / IP) and processes that occur within each layer of the network are discussed in data transmission section. Finally, various disturbances and their effects on the performance of telecommunication systems and networks are studied.

CPL Prodi yang Dibebankan

Learning Outcomes

(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-10) Mampu mengetahui dan menyikapi perkembangan terkini dibidang ilmu pengetahuan dan teknologi dengan mengedepankan nilai-nilai universal

(PLO-10) Capable to know and respond to the latest developments in science and technology by promoting universal values

Capaian Pembelajaran Mata Kuliah

Course Learning Outcomes

(CPMK-01) Mengetahui konsep dasar sistem telekomunikasi serta prinsip kerja jaringan data secara umum.

(CLO-01) Understanding the basic concepts of telecommunications systems and the principles of data networks in general.

(CPMK-02) Memahami prinsip kerja jaringan internet dan kedudukan informasi (konten) internet yang bersifat Over The Top (OTT).

(CLO-02) Understanding the working principle of internet networks and the position of Over The Top (OTT) internet information and content.

(CPMK-03) Memahami secara logis potensi gangguan yang muncul dan mempengaruhi performansi sistem telekomunikasi dan jaringan internet secara umum.

(CLO-03) Understanding the potential of interference that arises and affects the performance of telecommunications systems and internet networks in general.

(CPMK-04) Menunjukkan sikap bertanggungjawab dan bijaksana dalam bertelekomunikasi, khususnya ketika menggunakan jaringan internet (TCP/IP).

(CLO-04) Demonstrate a responsible and wise attitude in telecommunications, especially when using the internet network (TCP / IP).

Topik/Pokok Bahasan

Main Subjects

1. Komponen dasar, Klasifikasi Sistem dan Sejarah Telekomunikasi
Basic components, Classification of Systems and History of Telecommunications
2. Sumber Informasi, Konsep frekuensi & bandwidth serta Jenis pengkodean sinyal informasi
Information Sources, Concepts of frequency & bandwidth and Types of information signal coding
3. Medium Transmisi dan Karakteristiknya
Transmission Medium and Characteristics
4. Teknik Modulasi
Modulation Technique

5. Spektrum frekuensi & Propagasi gelombang radio
Frequency spectrum & radio wave propagation
6. Sistem Teleponi & Trafik Erlang
Erlang Telephony & Traffic System
7. Teknik Multipleksing
Multiplexing technique
8. Topologi jaringan, Protokol Jaringan dan Sistem internet (TCP/IP)
Network topology, Network Protocol and Internet System (TCP/IP)
9. Konsep Paketisasi, Error checking, Routing dan Flow control
Package concept, Error checking, Routing and Flow control
10. Gangguan & Performansi Sistem Telekomunikasi
Disruption & Performance of Telecommunications Systems

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] Roger L. Freeman, Fundamental of Telecommunications, Second Edition, John Wiley & Sons, 2005
- [2] Stallings, W., Data and Computer Communications, 10th Edition. Upper Saddle River, NJ, USA, Prentice Hall, 2014
- [3] Gupta, Prakash C., Data Communications and Computer Networks, Prentice Hall of India, New Delhi, 2006.
- [4] Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Fifth Edition, Pearson, 2013
- [5] Shanmugam, K.Sam, Digital and Analog Communication, John Wiley and Sons (WIE), International Edition, 1979.
- [6] Simon Saunders, Alejandro Aragón-Zavala, Antennas and Propagation for Wireless Communication Systems, 2nd Edition, John Wiley & Sons Ltd., 2007.

Prasyarat

Prerequisite(s)

EW184001 Pengantar Teknologi Elektro
EW184001 Introduction to Electrical Technology