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***	:	Jaringan Komunikasi Nir-Kabel / *Wireless Communication Networks*
2	**Kode Mata Kuliah / *Course Code***	:	EL234406
3	**Kredit / *Credits***	:	3 SKS
4	**Semester / *Semester***	:	7

Deskripsi Mata Kuliah / *Course Description*

Mata kuliah Sistem Komunikasi Nirkabel mengenalkan sistem komunikasi nirkabel, model kanal propagasi bergerak, teknik modulasi dan akses jamak, standar teknologi dan arsitektur sistem komunikasi nirkabel. Selanjutnya dikenalkan rancangan jaringan komunikasi nirkabel dan analisis kinerja jaringan komunikasi nirkabel. / *The Wireless Communication Systems course introduces wireless communication systems, models for mobile channel propagation, modulation techniques, multiple access methods, technology standards, and wireless communication system architectures. Furthermore, it covers the design of wireless communication networks and performance analysis of wireless communication networks*

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

CPL 5	*Mampu mendesain komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi / Able to design components, systems, and processes that are logical and realistic in accordance with specified specifications, while considering safety, social, cultural, environmental, and economic aspects.*
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.

CPL 7	Mampu mengetahui dan mengaplikasi metode, keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan teknik elektro dengan mengedepankan nilai-nilai universal / *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. Mampu menjelaskan sistem dan teknologi komunikasi nirkabel. / *Able to explain wireless communication systems and technologies.*
2. Mampu menganalisa teknologi dan rekayasa sistem komunikasi nirkabel. / *Able to analyze wireless communication technologies and system engineering.*
3. Mampu menyusun perencanaan jaringan komunikasi nirkabel. / *Able to develop wireless communication network plans.*
4. Mampu mengevaluasi kinerja sistem dan jaringan komunikasi nirkabel. / *Able to evaluate the performance of wireless communication systems and networks.*

Pokok Bahasan / *Contents*

1. Sistem komunikasi nirkabel / *Wireless Communication Systems*
2. Model dan kapasitas kanal komunikasi nirkabel (bergerak) / *Models and Capacity of Mobile Wireless Communication Channels*
3. Teknik modulasi dan akses jamak sistem nirkabel / *Modulation Techniques and Multiple Access in Wireless Systems*
4. Standard Teknologi dan arsitektur Komunikasi Nirkabel (Seluler) / *Wireless Communication Technology Standards and Architectures (Cellular)*
5. Konsep perencanaan sel dalam komunikasi nirkabel / *Cell Planning Concepts in Wireless Communication*
6. Perencanaan Jaringan komunikasi nirkabel / *Wireless Communication Network Planning*
7. Kinerja Jaringan Komunikasi Nirkabel / *Wireless Communication Network Performance*

Prasyarat / *Pre-requisite*

Sistem Komunikasi, Jaringan dan Rekayasa Trafik / *Communication Systems, Networks and Traffic Engineering*

Pustaka / *Reference*

1. T.S. Rappaport, "Wireless Communications Principles and Pracitces", 2nd ed., Prentice-Hall, 2002.
2. Farid Dowla, HANDBOOK OF RF AND WIRELESS TECHNOLOGIES, Elsevier, 2004
3. Valery P. Ipatov, Spread Spectrum and CDMA Principles and Applications, John Wiley & Sons, 2005
4. L. Hanzo, OFDM and MC-CDMA: A Primer, John Wiley & Sons, 2006
5. Farooq Khan, LTE for 4G Mobile Broadband Air Interface Technologies and Performance, Cambridge UP, 2009

6. K Daniel Wong, Fundamentals of Wireless Communication Engineering Technologies, John Willey & Sons, 2012
7. Haesik Kim, Design and Optimization for 5G Wireless Communications, John Wiley & Sons, 2020
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11. D. Tse, P. Viswanath, "Fundamentals of Wireless Communications", Cambridge University Press, 2005.
12. R. Prasad, A. Milhovska, New Horizons in Mobile and Wireless communications, Artech House, 2009
13. Yan Zhang, WiMAX Network Planning and Optimization-CRC Press, 2009
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15. K. Sharon Evans, Telecommunications Network Modelling, Planning and Design, The Institution of Engineering and Technology, 2004
16. Matthew Liotine, Critical Network Planning, Artech House, 2003
17. Janice Reynolds, Going Wi-Fi: A Practical Guide to Planning and Building an 802.11 Network, CMP, 2003