



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)  
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS  
DEPARTEMEN TEKNIK ELEKTRO  
Program Studi Sarjana (S1) Teknik Telekomunikasi

1	<b>Nama Mata Kuliah / Course Name</b> : Antena dan Propagasi Radio / <i>Antenna and Radio Propagation</i>
2	<b>Kode Mata Kuliah / Course Code</b> : EL234504
3	<b>Kredit / Credits</b> : 4 SKS
4	<b>Semester / Semester</b> : 5

#### Deskripsi Mata Kuliah / Course Description

Mata kuliah Antena dan Propagasi Radio mempelajari:

konsep radiasi gelombang elektromagnetik dari antena, parameter-parameter antena, antena kawat, antena pita lebar, antenna patch, dan antena array, serta mekanisme propagasi gelombang radio, redaman propagasi, dan disain link radio.

*The Antenna and Radio Propagation course studies: the concept of electromagnetic wave radiation from antennas, antenna parameters, wire antennas, broadband antennas, patch antennas, and antenna arrays, as well as radio wave propagation mechanisms, propagation attenuation, and radio link design.*

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

1. (CPL 04) Mampu menerapkan ilmu pengetahuan alam dan matematika serta teknologi dan rekayasa informasi untuk memperoleh pemahaman komprehensif pada bidang Teknik Telekomunikasi.  
*(PLO-04) Able to apply knowledge of sciences, mathematics, and information technology to acquire comprehensive understanding of engineering principles in Telecommunication Engineering*
2. (CPL 05) Mampu merancang 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.*
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. Memahami konsep radiasi antena, parameter-parameter antena dan mampu menghitung parameter antena. / *Understanding the concept of antenna radiation, antenna parameters and being able to calculate antenna parameters.*
2. Memahami, mampu menghitung dan menganalisa parameter antena kawat, antena pita lebar, antena patch dan antena array. / *Understanding, being able to calculate and analyze wire antenna parameters, broadband antenna parameters, patch antenna parameters, and antenna array parameters.*
3. Menguasai konsep perambatan gelombang radio di ruang bebas, efek atmosfer dan pantulan gelombang, perambatan gelombang permukaan dan gelombang ionosfir. / *Mastering the concept of radio wave propagation in free space, atmospheric effects and wave reflection, surface wave propagation, and ionospheric waves.*
4. Menguasai konsep difraksi, redaman hujan, noise dan link budget. / *Mastering the concept of diffraction, rain attenuation, noise, and link budget.*
5. Mampu menganalisa dan mendisain suatu link transmisi radio antar dua titik. / *Being able to analyze and design a radio transmission link between two points.*

**Pokok Bahasan / Contents**

1. Integral radiasi / *Radiation integral*
2. Parameter antena / *Antenna parameter*
3. Antena kawat / *Wire antenna*
4. Antena pita lebar / *Broadband antenna*
5. Antena patch / *Patch antenna*
6. Antena array / *Antenna array*
7. Perambatan gelombang di ruang bebas / *Free space wave propagation*
8. Pembiasan oleh lapisan atmosfer / *Atmospheric layer biasing*
9. Pantulan / *Reflection*
10. Difraksi / *Diffraction*
11. Efek Hujan / *Rain effects*
12. Surface wave dan Ionospheric wave / *Surface wave and Ionospheric wave*
13. Noise dan link budget / *Noise and link budget*

**Prasyarat / Pre-requisite**

Elektromagnetika / *Electromagnetics*

**Pustaka / Reference**

Utama / Primary :

1. W. L. Stutzman, G. A. Thiele, Antenna Theory and Design 3rd Ed., John Wiley & Sons, 2012.
2. C. A. Balanis, Antenna Theory, Analysis and Design 3rd Ed., John Wiley & Sons, 2005.

3. J. D. Parsons, Mobile radio propagation channel, John Wiley & Sons, 2000.
4. Simon R. Saunders , Alejandro Aragon-Zavala, Antennas and Propagation for Wireless Communication Systems, John Wiley & Sons, 2007.