



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 : Antena dan Propagasi Radio / <i>Antennas and Radio Propagation</i>
2	Kode Mata Kuliah / Course Code : EL234504
3	Kredit / Credits : 4 SKS
4	Semester / Semester : 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 Antennas and Radio Propagation course covers the following topics: the concept of electromagnetic wave radiation from antennas, antenna parameters, wire antennas, wideband antennas, patch antennas, antenna arrays, as well as the mechanisms of radio wave propagation, propagation attenuation, and radio link design*

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

CPL 1 Mampu menunjukkan sikap dan karakter yang mencerminkan: ketakwaan kepada Tuhan Yang Maha Esa, etika dan integritas, berbudi pekerti luhur, peka dan peduli terhadap masalah sosial dan lingkungan, menghargai perbedaan budaya dan kemajemukan, menjunjung tinggi penegakan hukum mendahulukan kepentingan bangsa dan masyarakat luas, melalui kreatifitas dan inovasi, eksekusi, kepemimpinan yang kuat, sinergi, dan potensi lain yang dimiliki untuk mencapai hasil yang maksimal / *Being able to demonstrate attitudes and characteristics that reflect: devotion to the One Almighty God, ethics and integrity, noble virtues, sensitivity and care towards social and environmental issues, appreciation of cultural diversity and inclusivity, upholding the rule of law with a priority on the interests of the nation and the wider community, through*

creativity and innovation, excellence, strong leadership, synergy, and other potentials possessed to achieve maximum results.

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 understanding and applying the latest methods and skills in the field of science and technology to solve electrical engineering problems while emphasizing 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 the ability to calculate antenna parameters.*
2. Memahami, mampu menghitung dan menganalisa parameter antena kawat, antena pita lebar, antena patch dan antena array / *Understanding, calculating, and analyzing wire antennas, broadband antennas, patch antennas, and antenna arrays.*
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, wave reflection, surface wave propagation, and ionospheric waves.*
4. Menguasai konsep difraksi, redaman hujan, noise dan link budget. / *Mastering the concepts of diffraction, rain attenuation, noise, and link budget.*
5. Mampu menganalisa dan mendisain suatu link transmisi radio antar dua titik. / *Capable of analyzing and designing a radio transmission link between two points.*

Pokok Bahasan / Contents

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

Prasyarat / Pre-requisite

Pustaka / Reference

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.
5. Robert E. Collin, *Antenna and Radiowave Propagation*, Mc Graw Hill, 1985.
6. Theodore S. Rappaport, *Wireless Communications Principles and Practice*, 2nd ed., Dorling Kindersley, 2009.
7. Rekomendasi IEEE P530 dan P838.