Mata Kuliah ***Course***	Nama MK *Name*	:	Sistem Komunikasi I *Communication Systems 1*
	Kode MK *Code*	:	EE184531
	Kredit *Credit*	:	3 sks
	Semester *Semester*	:	V (Wajib) *V (Compulsory)*
	Beban Belajar *Workload*	:	Kuliah : 3 x 50 = 150 menit/minggu Latihan/tugas : 3 x 60 = 180 menit/minggu Belajar mandiri : 3 x 60 = 180 menit/minggu *Lectures : 3 x 50 = 150 min/week* *Exercises/Assignments : 3 x 60 = 180 min/week* *Self learning : 3 x 60 = 180 min/week*
	Tingkatan *Module Level*	:	Sarjana (S1) *Undergraduate*
	Penanggung Jawab *PIC*	:	Dr. Ir. Titiek Suryani, MT
	Pengajar *Lecturer*	:	Dr. Ir. Titiek Suryani, MT
	Bahasa *Language*	:	Bahasa Indonesia dan Bahasa Inggris *Bahasa Indonesia and English*
	Persyaratan dan Peraturan *Requirement and Regulation*	:	Setiap mahasiswa harus menghadiri setidaknya 75% dari jumlah perkuliahan untuk dapat mengikuti ujian *A student must have attended at least 75% of the lectures to sit in the exams*

Deskripsi Mata Kuliah
Description of Course

Mata kuliah Sistem Komunikasi I membahas tentang Transmisi dan pertukaran informasi menggunakan sinyal listrik dan gelombang elektromagnetik. Mempelajari teknik modulasi analog meliputi modulasi amplitudo, modulasi sudut dan modulasi digital biner, konsep demodulasi menggunakan teknik demodulasi koheren dan filtering serta deteksi selubung untuk memperoleh informasi kembali. Konsep perhitungan kinerja sistem komunikasi analog dan digital dalam pengaruh derau.

The course of Communication system 1 discusses transmission and exchange of information uses electrical signals and electromagnetic waves. Learning analog modulation techniques including amplitude modulation, angular modulation and binary-digital modulation, the concept of demodulation uses coherent demodulation and filtering techniques and shell detection to obtain information again. The concept of calculating the performance of analog and digital communication systems in the effects of noise.

CPL Prodi yang Dibebankan
Learning Outcomes

(CPL-05) Mampu mengidentifikasi, memformulasikan dan menyelesaikan permasalahan dibidang teknik elektro

(PLO-05) Capable to identify, formulate and solve problems in the field of electrical engineering

(CPL-06) Mampu mematuhi hukum dan perataturan yang berlaku, etika profesi dan bertanggung jawab pada bidang kerjanya dengan mempertimbangkan konteks global, ekonomi, lingkungan, dan sosial

(PLO-06) Capable to comply with applicable laws and regulations, professional ethics and be responsible for the field of work taking into account the global, economic, environmental and social context.

(CPL-11) Mampu menerapkan metode, ICT, dan perangkat modern dalam penyelesaian permasalahan dibidang teknik elektro

(PLO-11) Capable to apply methods, ICT, and modern devices in solving problems in the field of electrical engineering

Capaian Pembelajaran Mata Kuliah

Course Learning Outcomes

(CPMK-01) Menguasai konsep transmisi sinyal pesan baik secara analog dan digital biner. Menguasai teknik pencampuran frekuensi, teknik filtering, dan teknik modulasi untuk transmisi sinyal pesan secara analog dan digital biner. Menguasai teknik-teknik demodulasi dan deteksi optimum untuk memperoleh kembali sinyal pesan dari sinyal transmisi yang terganggu derau putih Gaussian. Menguasai metode evaluasi kinerja sistem komunikasi analog dan digital.

(CLO-01) Mastering the concept of message signal transmission both in analog and binary digital. Mastering frequency mixing techniques, filtering techniques, and modulation techniques for transmitting message signals in analog and binary digital. Mastering demodulation and optimum detection techniques to recover message signals from transmission signals that are disturbed by white Gaussian noise. Mastering the methods of performance evaluation of analog and digital communication systems.

(CPMK-02) Mampu menganalisis teknik transmisi sinyal pesan analog dan digital biner dan mampu mengevaluasi kinerja sistem komunikasi analog dan digital biner yang terkena gangguan derau.

(CLO-02) Able to analyze analog and digital message signal transmission techniques and be able to evaluate the performance of binary analog and digital communication systems that are affected by noise.

(CPMK-03) Mampu menggunakan software Matlab/Simulink untuk melakukan visualisasi dan eksperimentasi konsep transmisi sinyal pesan secara analog dan digital biner melalui kanal dengan gangguan derau.

(CLO-03) Able to use Matlab / Simulink software to visualize and experimentation the concept of transmitting message signals in analog and binary digital through channel with noise.

(CPMK-04) Menunjukkan sikap bertanggung jawab atas pekerjaan di bidang keahliannya secara mandiri.

(CLO-04) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(CPMK-05) Bekerja sama untuk dapat memanfaatkan semaksimal mungkin potensi yang dimiliki.
(CLO-05) Working together to be able to make the most of his/her potential.

Topik/Pokok Bahasan
Main Subjects

1. Konsep Sinyal dan Spektrum Sinyal komunikasi.
   Concepts of Signals and Spectrum of Communication Signals.
2. Konsep transmisi ideal, filtering kuadratur dan transformasi Hilbert.
   The ideal transmission concept, quadrature filtering and Hilbert transformation.
3. Konsep Modulasi Amplitudo.
   Concept of Amplitude Modulation.
4. Konsep Modulasi Sudut.
   Concept of Angular Modulation.
5. Konsep Modulasi Pulsa: transisi dari komunikasi analog ke komunikasi digital.
   Concept of Pulse Modulation: the transition from analog communication to digital communication.
6. Konsep Trasmisi Digital Base-band.
   Concept of Base-band Digital Transmission.
7. Konsep Modulasi Band-pass Digital.
   Digital Band-pass Modulation Concept.
8. Derau dalam Sistem Komunikasi Analog.
   Noise in Analog Communication Systems
9. Derau dalam Sistem Komunikasi Digital.
   Noise in Digital Communication Systems.

Pustaka
Reference(s)

[1] Simon Haykin and Michael Moher, Introduction to Analog and Digital Communications, John Wiley and Sons, 2007.
[2] Hwei Hsu, Ph.D., Schaum's outline of theory and problems of Analog and Digital Communications, 2nd , Mc-Graw Hill, 2003.
[3] Leon W. Couch, II, Digital and analog communication systems, 8th Edition,Prentice Hall, 2016.
[4] Grahame Smillie, Analogue and Digital Communication Techniques, Butterworth-Heinemann, 1999.
[5] Michel C. Jeruchim, Philip Balaban, and K. Sam Shanmugan. Simulation of communication systems: modeling, methodology and techniques. Springer Science & Business Media, 2006.

Prasyarat
Prerequisite(s)

- EE184305 Sinyal dan Sistem
  EE184305 Signals and Systems
- EE184405 Probabilitas, Statistik dan Proses Stokastik
  EE184405 Probabilitas, Statistics, and Stochastic Processes