

Course	Course Name	: Communication Systems 1
	Code	: EE184531
	Credits	: 3
	Semester	: V

Description of Course

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.

Learning Outcomes

Knowledge

(P02) Mastering the concepts and principles of engineering, and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics

Specific Skill

(KK01) Able to formulate engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

General Skill

(KU12) Able to implement information and communication technology (ICT) in the context of implementation of his/her work.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

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.

Specific Skill

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.

General Skill

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.

Attitude

Demonstrating attitude of responsibility on work in his/her field of expertise independently.
Working together to be able to make the most of his/her potential.

Main Subjects

1. Concepts of Signals and Spectrum of Communication Signals.
2. The ideal transmission concept, quadrature filtering and Hilbert transformation.
3. Concept of Amplitude Modulation.
4. Concept of Angular Modulation.
5. Concept of Pulse Modulation: the transition from analog communication to digital communication.
6. Concept of Base-band Digital Transmission.
7. Digital Band-pass Modulation Concept.
8. Noise in Analog Communication Systems.
9. Noise in Digital Communication Systems.

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.

Prerequisite(s)

EE184305 Signals and Systems
EE184405 Probabilitas, Statistics, and Stochastic Processes
