

Course	Name	: Communication Systems 2
	Code	: EE184631
	Credits	: 3
	Semester	: VI

Description of Course

The Communication Systems II course discusses the concept of digital information transmission with binary and M-digital modulation techniques consisting of amplitude shift keying (ASK), phase shift keying (FSK), phase-shift-keying (PSK) and a combination of two ASK modulations -PSK (M-ary QAM), besides, channel channeling techniques are also discussed to improve noise disturbed system performance and source coding techniques for channel capacity efficiency.

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 digital message signal transmission includes binary and M-ary modulation with a coherent demodulation technique using matched filter techniques, correlation and maximum likelihood detection techniques to recover message signals with the smallest possible error rate. Mastering channel coding techniques and source coding techniques to improve the performance of digital communication systems so that their power and bandwidth become more efficient.

Specific Skill

Able to analyze the techniques of baseband and bandpass digital message signal transmission both binary and ary and able to calculate the performance of digital communication systems with noise disturbances. Able to improve the performance of digital communication systems using channel coding techniques and source coding techniques.

General Skill

Able to use Matlab / Simulink software to visualize and experiment the concept of transmitting digital binary and m-ary message signals through channels with noise disturbances.

Attitude

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

Main Subjects

1. The concept of signals in a communication system.
2. The concept of detecting baseband binary signals in Gaussian noise.
3. The concept of binary and M-ary bandpass modulation and demodulation.
4. The concept of the recipient is coherent and non-coherent.
5. Theory of calculating the performance of digital communication signals.
6. Concept of channel coding.
7. Information theory and source coding concepts.

Reference(s)

- [1] Bernard Sklar and Pabitra Kumar Ray, Digital communications: Fundamentals and Applications, 2nd Edd., PEARSON, 2014.
- [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)

EE184531 Communication Systems 1
