



Philadelphia University

Faculty of Engineering - Department of Communications and
Electronics Engineering

Course Information

Title: Analog Communications (650420)

Prerequisite: Probability & Random Variables, Signals and Systems (650364) (0650320)

Credit Hours: 3 credit hours (16 weeks per semester, approximately 44 contact hours)

Textbook: "Communication Systems," Simon Haykin, 5th Ed., John Wiley, 2010".

- References:**
- "Digital and Analog Communication Systems " L. Couch, 6th Ed., Prentice-Hall, 2002.
 - "Analog and Digital Communication Systems " Martin Rodin, Prentice-Hall, 1991.
 - "Introduction to Communication Systems " F. Stremler, Addison Wisley Company, Inc., 1990.

Catalog Description : The course introduces the Continuous-Wave Modulation Techniques, Frequency Division Multiplexing (FDM), FM Stereo Multiplexing, and Superhetrodyne Receiver, Noise in AM and FM receivers, Sampling Theore: Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM).

Course Topics

Upon successful completion of this course, a student should:

week	Topics
1, 2, 3	Introduction to Communication Systems, Communication Channels, Bandwidth Definitions, Filters and Modulation Process.
4,5,6,7	Amplitude Modulation (AM), Double Sideband-Suppressed Carrier (DSB-SC), Costas Receiver, QAM, Filtering of Sidebands, Single Sideband (SSB), Vestigial Sideband (VSB), Frequency – Division Multiplexing (FDM).
8,9	Angle Modulation (Frequency Modulation & Phase Modulation), FM Modulation and Demodulation Methods, FM stereo multiplexing, Superhetrodyne Receiver.
10,11	Noise in Analog Modulation (AM and FM) receivers.
12,13,14	Sampling Theorem, Pulse Amplitude Modulation (PAM), Pulse Position Modulation (PPM), Pulse Width Modulation (PWM), Time Division Multiplexing (TDM).
15	Course Project Discussion
16	Final Exam

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1.	Understanding Wave Modulation (AM, DSB-SC, SSB, VSB, PM and FM) and the advantages of each type of modulation, implementation and practical design.	[a,e]
2.	Apply the principle of modulation over Frequency Division Multiplexing (FDM), FM Stereo Multiplexing, and Superhetrodyne Receiver.	[e]
3.	Compare different modulation types in term of noise at the channel input and output and hence evaluate the noise effect by finding the figure of merit.	[e]
4.	Design a communication system	[c]
5.	Evaluate and modify a communication system according to different application requirements	[a,c]

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Two written exams will be given. Each will cover about 4-weeks of lectures

Quizzes: 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Participation: Questions will be asked during lecture and the student is assessed based on his/her response

Final Exam: The final exam will cover all the class material.

Grading policy:

First Exam	20%
Second Exam	20%
Homework, Quizzes and participation	20%
Final Exam	40%
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Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

February, 2017