



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
ECE-350	Principles of Communications	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
ECE-331	Engineering	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Required	Engineering	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	Dr Antonis Hadjiantonis	3 <sup>rd</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face-to-face	N/A	None

### Course Objectives:

The main objectives of the course are to:

- introduce the need of electrical signal communication
- present energy and power signals and signal distortion
- introduce and analyze various analog and digital modulation techniques
- prove the sampling theorem and use it in digital signal communication
- explore various digital transmission concepts

### Learning Outcomes:

After completion of the course students are expected to be able to:

1. identify the main points of a communication link
2. examine signals in both time- and frequency domain
3. interpret how signals are transmitted through linear channels
4. illustrate the need for modulation in communication with electrical signals
5. solve basic analog and digital modulation problems
6. design fundamental analog and digital communication link parameters
7. apply the sampling theorem in analog to digital conversions
8. produce communication-related computer projects

**Course Content:**

1. Introduction to the communication system and its basic building blocks.
2. Analysis and transmission of signals: Review of Fourier series, Fourier transform and properties
3. Signal transmission: distortion, bandwidth versus rate of transmission, energy spectral density, power spectral density.
4. Introduction to analog modulation techniques: DSB-AM, SSB-AM, General Angle Modulation, FM and PM.
5. Sampling theorem. Quantization process, Quantization noise. Digital communication system, pulse amplitude modulation (PAM), PCM and Delta modulation, digital multiplexing
6. Line coding, pulse shaping, M-ary communication.

**Learning Activities and Teaching Methods:**

Lectures

**Assessment Methods:**

Homework, Projects, Mid-Term, Final Exam

**Required Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Modern Digital and Analog Communication Systems	B.P. Lathi	Oxford University Press (4E)	2009	978-0195331455

**Recommended Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
An Introduction to Signal & Noise in Electrical Communication	A. Bruce Carlson, Paul B. Crilly & Janet C. Rutledge	McGraw Hill	2002	0-07-011127-8