# Digital Comunications

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

## In brief

- **plugin.odf-inp:PLUGINS_ODF_COURSE_NBHOURS_TXT:** 9 lectures, 6 project sessions
- **Code:** N9MS01B

# Presentation

## Objectives

- To be able to explain the role of the different elements in a communication channel allowing to transmit a digital information.

- To be able to analyze a basic digital transmission channel (modulation/demodulation on a Additive white Gaussian noise channel) in terms of spectral and power efficiencies.

- To be able to implement basic digital transmission channels, to compare and optimize them in terms of spectral and power efficiencies.

## Description

The following issues shall be addressed by this teachning unit:

1- Role of the different elements in a communication channel allowing to transmit a digital information.

2- Generation of a signal allowing to transmit a binary information (digital modulation) :

- for a baseband transmission,

- for a transmission on a carrier frequency (ASK, PSK, QAM modulations),

- notion of spectral efficiency.

3- Basic modulation for the transmission channel.

4- Definition of an optimized digital demodulator :

- power efficiency,

- interference between symbols and Nyquist criterion,

- matched filtering.

5- Bit error rate computation.

6- Notion of complex enveloppe and equivalent lowpass channel for transmissions on carrier frequencies.

7- Example of a basic digital transmission channel : DVB-S physical layer.

# Useful info

## Place

Toulouse