Introduction to Digital Communications

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Ametys Code:** MHAR35XW
- **Open to exchange students:** Yes

Presentation

Objectives

To be able to implement, analyze and optimize simple transmission chains, in baseband and on carrier frequency.

Description

This course presents the fundamentals of the physical layer of a telecommunications system and how to optimize the digital modulator/demodulator block based on the desired bit rate and bit error rate (BER). Digital modulations are studied in baseband (PAM) and on carrier frequencies (ASK, PSK, QAM). Their performance is established in terms of spectral efficiency and power efficiency. To this end, the Nyquist criteria and matched filtering are explained, as well as the concepts of complex envelope and equivalent low-pass filtering. A project provides an introduction to other components of the basic transmission chain: error-correcting coding, synchronization, and equalization.

Pre-requisites

Signal processing and digital signal processing