

Information Processing and High-Speed Networks

Person in charge:

Prerequisite: IT.1101 / IT.1201

Organization: Lectures 33h / Tutorials 12h

Evaluation: 2 written exams

ECTS: 5 credits

Context

This module introduces the basic concepts of information theory. It first deals with information coding, redundancy, data compression and cryptography. Then, it studies the high-speed network, in particular the satellite networks and the optical networks.

Objectives

Skills

In terms of skills, this module aims to enable students to:

- Acquire basic principles of information processing (information coding, redundancy, data compression and cryptography).
- Acquire basic principles for designing and realizing of very high-speed networks (such as satellite networks and optical networks).

Knowledge

This module enables students to develop the following concepts and skills.

- **Concepts**
 - The characteristics of information processing.
 - The architecture and engineering of very high-speed networks.
 - The radio waves and their characteristics applied to satellite links.
 - The optical waves and their propagation characteristics.

- **Know-How**
 - The study of the transmission of messages between a sender and a recipient via a communication channel.
 - The sizing and the deployment of satellite and terrestrial broadcasting networks (Basic level).
 - The Study of the specificities of optical networks.
- **Keywords**
 - Entropy, cryptography, coding and redundancy.
 - Optical fibers
 - Satellite

Pedagogical Approach

- This module is divided into 2 parts: the first one is devoted for the explanation of the principles of information processing while the second is for high-speed transmissions (satellite and optical networks).
- During lectures and exercises, the key concepts and keywords, as well as concrete examples, will be presented.
- At the end of each part, an individual written exam will assess each person's abilities to implement the skills gained through various problems.