HF optoelectronic components and circuits

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Ametys Code:** N9EE12B
- **Open to exchange students:** Yes

Presentation

Objectives

Understand the drivers behind the technological choices that enable the creation of high-speed fiber optic communication systems.

Be able to design a high-frequency fiber optic communication system.

Analyze the performance limits of fiber optic communication systems and identify the limiting factors.

Description

This course presents the latest developments in optoelectronic systems in the high-frequency domain, with a focus on short-range telecommunications applications such as the 10Gb Ethernet standard. The modeling of components essential to these systems, such as laser diodes, photodiodes, and electro-optical modulators, is presented in detail. The design of circuits dedicated to high-frequency modulation of laser diodes and amplification of photodetected signals allows for a system-level approach to the design of communication systems in the GHz range.

Pre-requisites

Knowledge of semiconductor components for optics

Knowledge of fiber optic telecommunications (structure of an optical fiber, attenuation, and dispersion).

Basic knowledge of noise in electronics