Optoelectronic Components and Circuits

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Ametys Code:** N9EE04B
- **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-distance telecommunications applications such as the 10Gb Ethernet standard. The modeling of the essential components of these systems: laser diodes, photodiodes, electro-optical modulators, etc. is presented in detail. The design of circuits dedicated to the high-frequency modulation of laser diodes and the amplification of photodetected signals allows for a system-level approach to the design of a communication system 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