Optoelectronics Tutorials

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

In brief

- **Ametys Code:** M34HL8HY
- **Open to exchange students:** Yes

Presentation

Objectives

The main objective is to enable students to put into practice the concepts covered in the Optoelectronics course in order to better understand the various concepts in optical telecommunications and optical metrology, such as losses and attenuation in fibre components, bandwidth of fibre optic communication systems, and even optical interferometry for measuring physical quantities through five practical sessions. These experiments have been designed to enable students to better understand and master the fundamental topics covered in the second-year Optoelectronics course in the INSyS and SysCom programmes, and to equip them for success in the fields of optical telecommunications and optical metrology.

Description

This series of Optoelectronics practicals comprises five experiments covering various topics in optical telecommunications and optical metrology. In Opto 1, students characterise optical losses in fibre components (such as long fibres, isolators, optical attenuators, etc.) used in optical telecommunications. In Opto 2, they characterise the time of flight and chromatic dispersion in optical fibres, two fundamental concepts in optical fibre propagation. In Opto 3, students also manipulate light sources (LEDs and laser diodes) to characterise their response and radiation profile. In Opto 4 lab work, students will use a fibre optic interferometer to

measure the displacement of a target or object with sub-micrometric resolution in the context of precision optical metrology. Finally, in Opto 5 lab work, students will estimate the bandwidth of an optical telecommunications link based on different optical fibres.

Pre-requisites

Have attended the second-year Optoelectronics course at ENSEEIHT, be able to use and handle the various equipment and instruments seen in practical work (oscilloscope, spectrum analyser, function generator, photodetector, etc.), understand the principles of optical calculation, be able to analyse the results of measurements taken in Optoelectronics practical work sessions.