

26945 - Slides and Photonic Systems

Syllabus Information

Academic year: 2024/25

Subject: 26945 - Slides and Photonic Systems

Faculty / School: 100 - Facultad de Ciencias

Degree: 447 - Degree in Physics

ECTS: 5.0

Year:

Semester: Second semester

Subject type: Optional

Module:

1. General information

The subject aims to show students the importance of optical communications systems in today's society. The general goal of the subject is to describe the physics of these systems.

The objectives are as follows:

- To know the technology and characteristics of semiconductor devices.
- To understand the optical fibres used in transmission.
- To handle instrumentation for the physical characterization of devices.
- To be aware of the current state of technology and research in this field.

It is recommended to have taken the subjects Electromagnetism, Electromagnetic Waves, Optics and Physical Electronics.

2. Learning results

- Design and assemble the emission, transmission and detection stages in a simple optical communications system.
- Measure and characterize optical attenuation, chromatic dispersion and nonlinearities associated with optical fibre propagation.
- Characterize various semiconductor optical emission sources.
- Properly integrate diverse photonic devices into a system.
- Optimize the electrical domain conversion stage in an optical transmission system.

3. Syllabus

1. Semiconductor photonic devices.
2. Optical fibres: fundamentals and transmission characteristics.
3. Characterization techniques of optical fibres and passive components.
4. Optical amplifiers.
5. Electro-optical modulators and optical signal modulation schemes.

4. Academic activities

- Participative master classes.
- Case-based learning and group work.
- Learning knowledge in the laboratory.
- Tutorial classes of case analysis and practical problem solving in groups.
- Laboratory practices and demonstrations, data collection and reporting

5. Assessment system

The student must demonstrate that they has achieved the intended learning results through the following assessment activities:

- Laboratory and numerical simulation practices. The corresponding reports will be prepared with the results obtained. The grade for this activity contributes 40% to the final grade.
- Carrying out of monographic works. Specific topics within the field of the subject will be proposed for the realization of a monographic work of fine-tuning and collection of relevant information on the subject. A brief presentation of the work done will be made to the whole group before the end of the term. The grade for the paper contributes 30% to the final grade.
- Completion of a final individual test on theoretical and practical contents of the subject. The grade of this activity contributes 30% to the final grade.

Passing the subject by means of a single global test

In the exceptional case of not being able to follow the subject activities, the subject may be passed through a single test that may include practical laboratory activities in addition to a written exam on the contents of the syllabus.

6. Sustainable Development Goals

- 4 - Quality Education
- 7 - Affordable and Clean Energy
- 8 - Decent Work and Economic Growth