

60984 - Photonics and optical engineering

Syllabus Information

Academic year: 2023/24

Subject: 60984 - Photonics and optical engineering

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 623 - Master's Degree in Telecommunications Engineering

ECTS: 6.0

Year: 2

Semester: First semester

Subject type: Optional

Module:

1. General information

This subject proposes the acquisition of knowledge and experience in a research field of growing application, both in communications technologies and in other fields of engineering. However, this is not always well covered in the classical curricula. Thus, it can be an important and differential complement in the training of the student of the Master in Telecommunication Engineering.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), so that the acquisition of the learning results of the subject will contribute to some extent to the achievement of Objectives 7.2 of Goal 7, 8.2 of Goal 8 and 9.5 of Goal 9.

2. Learning results

- To know the different fields of application of optical engineering and photonics. R2: To be able to understand and design basic optoelectronic circuits.
- To understand the most common optical measurement techniques and be able to design a simple optical measurement scheme in different situations.
- To understand and use the fundamentals of interferential optics.

3. Syllabus

TOPIC 1. Introduction to optics and photonics engineering. Fields of application

TOPIC 2. Optoelectronics. Synchronous detection in optical instrumentation

TOPIC 3. Geometric optics and optical systems design.

TOPIC 4. Integrated optics and optical sensors.

TOPIC 5. Advanced fibre optic applications.

TOPIC 6. Interferential optics.

TOPIC 7. Optical engineering in industrial applications.

4. Academic activities

The activities are divided into theoretical and practical laboratory classes with different aspects of current developments in optics and photonics. The activities are aimed at facilitating the assimilation of theoretical concepts, complementing them with practical ones, so that the basic knowledge and skills related to the competencies foreseen in the subject are acquired.

The start and end dates of the academic year and the specific subject timetable as well as the dates of the laboratory practices and seminars will be made public according to the schedules established by the School.

5. Assessment system

The subject will be evaluated as follows:

1. Laboratory practices (50%, minimum of 5 out of 10): they will be evaluated taking into account the attitude of the students and the results obtained in their experiments in the laboratory as well as the reasoned discussion of the same.

Students who have not obtained the minimum grade in the laboratory practices will have to take a test related to them in the global assessment test.

2. Final Exam (50%, minimum of 4 out of 10): The test will consist of a series of theoretical-practical questions related to the contents of the theoretical and laboratory training.

The student is entitled to a global test in each of the exams established throughout the academic year. Dates and times will be determined by the School.