

Academic Year: ( 2023 / 2024 )

Review date: 16-05-2023

Department assigned to the subject: ENG/Masters interuniversitarios

Coordinating teacher: GEDAY , MORTEN A.

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

The students are expected to have completed the mandatory courses of the Master, especially the course on Photonic Technologies II and III.

**OBJECTIVES**

Basic skills:

- Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context (CB6).
- That the students can apply their knowledge and ability to solve problems in new or unfamiliar in wider or multidisciplinary environments related to their field of study (CB7).
- That the students can integrate their knowledge, as well as handle the complexity of making judgements from an incomplete or limited information, but which could include reflections about the social and ethic responsibilities that could be linked to the application of their judgements and knowledge (CB8).
- That the students possess learning skills that allow them following their long-life learning in a self-conducted and self-sufficient way (CB10).

General skills:

- Ability to propose, design, implement and maintain a system with photonic components for a specific application (CG2).

Specific skills:

- Handling of tools aiming to design photonic devices and systems (CE2).
- To be aware of the current trends in different applications of photonic technologies and learned experiences from real cases (CE3).
- Capacity of selecting novel photonic components, technologies and subsystems (CE5).
- Capacity of analyzing and designing photonic systems for applications in communications and sensing (CE7).
- Capacity of effectively searching information, as well of identifying the state of the art in a technological problem in the field of photonic devices and systems (CE8).

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Introduction (lecture)
2. IM/DD Optical Communication Systems (Lecture)
3. WDM Optical communications Systems (Lecture)
- 4.1 Access Networks (lecture)
- 4.2 Access Networks. Lab Session 1 (lab)
- 4.3. Access Networks. Lab Session 2 (lab)
- 4.4. Access Networks. Lab Session 3 (lab)
- 5.1 Simulation of Optical Access Networks (lab)
- 5.2 Simulation of Optical Access Networks (lab)
6. Coherent Optical Communications Systems (lectures)
7. Advanced Optical Communications Systems (lecture).

## LEARNING ACTIVITIES AND METHODOLOGY

### Teaching activities

- Lectures
- Practical classes
- Theoretical and practical classes
- Laboratory practices
- Tutorials
- Team work
- Individual student work

### Methodology

- Exhibitions in class with teacher support and audiovisual media, in which the main concepts of matter are developed and the literature is provided to supplement student learning.
- Critical reading of subject texts recommended by the teacher: newspaper articles, reports, manuals and / or academic papers, either for later discussion in class, either to expand and consolidate the knowledge of the subject.
- Resolution of practical cases, problems, etc. posed by the teacher individually or in groups.
- Preparation and defense of papers and reports individually or in groups.

## ASSESSMENT SYSTEM

### Ordinary call:

- Final exam (individual) 60%
- Individual or group works, including written or oral during the course: 40%
- In both cases there is a minimum mark of 3.5

### Extraordinary call:

- The student may follow the continuous evaluation procedure with the same structure as in the ordinary call, or go for a final exam (100% of the final grade).

**% end-of-term-examination:** 60

**% of continuous assessment (assignments, laboratory, practicals...):** 40

## BASIC BIBLIOGRAPHY

- B.E.A. Saleh, M.C. Teich Fundamentals of Photonics, Wiley, 2007
- G.P. Agrawal Fiber-optic communication systems, Wiley Interscience, 2010
- I. Kaminow, T. Li, A. Willner Optical Fiber Communications Vol. VI, Systems and Networks, Academic, 2013