

30358 - Laboratory of Optical Communication

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	438 - Bachelor's Degree in Telecommunications Technology and Services Engineering
ECTS	6.0
Course	4
Period	First semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

Teaching Methodology:

Theory lesson: Exposition of the fundamental contents of the subject. This activity will be developed in the classroom.

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Practical lesson: The teacher will propose practical questions whose solution will require the application of the concepts previously explained. These activities are proposed and presented in the classroom, but can be prepared and developed outside, both individually or in group.

Laboratory class: The students perform practical tasks to consolidate some of the concepts developed in the lessons. These classes will be organized in small groups of students and will take place in a laboratory. For this activity, it is necessary the presence of the student in the laboratory.

Tutored assignments: The teacher will propose some assignments to get further insight into some aspects of the subject. These activities are proposed and presented in the classroom, but can be prepared and developed outside, both individually or in group.

Individual tutoring: Individual assistance to the students.

5.2.Learning activities

The activities designed to learn this subject are the following:

- **Theory lessons** , where the theoretical basis of the laboratory activities is explained. It will be developed in the classroom or in the lab. There will be 2 to 4 two-hour lessons per term (4-8 hours).

- **Laboratory sessions** , where the students will learn to use software and equipment specific to the subject in order to perform tasks that will help them to assimilate some concepts. This activity requires the presence of the student and will be developed in small groups in the Optical Laboratory on the third floor of the Ada Byron Building in Campus Río Ebro. There are 9 two-hour sessions (18 hours per term).

- **Tutored assignments** , proposed by the teacher to help the students to get further insight into some particular aspects of the subject. These activities are proposed and presented in the classroom, but can be prepared and developed outside, both individually or in group.

- **Individual presentation of the tutored assignments** related to the laboratory activity. In these sessions the student will explain his/her work and his/her results. Each presentation will be followed by a discussion with the rest of the students and the teaching. These sessions will be held in the classroom or in the lab. There will be 2 to 4 two-hour discussion sessions per term (4-8 hours).

5.3.Program

Optical Communications Laboratory:

- Manipulation and characterization of different types of optical fibers.
- Handling and characterization of active devices: optical sources, photodetectors, and optical amplifiers.
- Passive devices use and characterization: Multiplexers, couplers, etc.
- Use and programming of optical networks simulation software

5.4.Planning and scheduling

During one term, the activities will be scheduled as follows:

- Theory lessons integrated at the beginning of each block with and practical lessons, 2 to 4 hours at the beginning and in the middle of the term.
- Laboratory sessions in reduced groups, 9 two-hour sessions, approximately 1 per week.
- Presentations sessions, 2 to 4 hours in the middle and at the end of the term.

The detailed Activity Schedule for each particular year is published using the digital support provided by Universidad de Zaragoza.

In any case, the theory and practical lessons are distributed according to the schedule established by the Engineering and Architecture School (EINA). The same holds for the laboratory sessions for which the student has the option to join one of the available lab groups.

The global evaluation examinations will be held in the dates established by the EINA.

5.5. Bibliography and recommended resources

Using the digital support available in University of Zaragoza, the students of the course will have access to all documentation provided by the teachers.

BIBLIOGRAPHY: Books to expand some of the concepts explained in class.

- Keiser, Gerd. Optical Fiber communications / Gerd Keiser . - 2nd edition New York [etc.] : McGraw-Hill, cop. 1991
- Senior, John. Optical fiber communications : principles and practice / John M. Senior . - 2nd. ed. New York [etc.] : Prentice Hall, cop. 1992
- Gowar, John. Optical communication systems / John Gowar . - 2nd. ed. New York [etc.] : Prentice Hall, cop. 1993
- Agrawal, Govind P.. Fiber-Optic communication systems / Govind P. Agrawal . - 3rd ed. New York [etc.] : John Wiley & Sons, cop. 2002
- [Fibras Ópticas] - Snyder, Allan W.. Optical waveguide theory / Allan W. Snyder, John D. Love . 1st ed. London [etc] : Chapman and Hall, 1983
- [Fibras Ópticas] - Ghatak, Ajoy. Introduction to fiber optics / Ajoy Ghatak, K. Thyagarajan . [1st ed.] Cambridge : Cambridge University Press, cop. 1998
- [Fibras Ópticas] - Capmany, José. Fundamentos de comunicaciones opticas / José Capmany, F. Javier Fraile-Peláez, Javier Martí . Madrid : Sintesis, D.L. 1998
- [Fuentes, detectores] - Saleh, Bahaa E.A.. Fundamentals of photonics / Bahaa E.A. Saleh, Malvin Carl Teich . [1st ed.] New York [etc.] : Wiley and Sons, cop. 1991
- [Fuentes, detectores] - Capmany, José. Fundamentos de comunicaciones opticas / José Capmany, F. Javier Fraile-Peláez, Javier Martí . Madrid : Sintesis, D.L. 1998
- [Sistemas] - Kaminov, I . Optical Fiber Telecommunications IIIA / I. KAMINOV & T. KOCH (Eds.) Academic Press, 1997
- [Sistemas] - Kaminov, I . Optical Fiber Telecommunications IIIB / I. KAMINOV & T. KOCH (Eds.) Academic Press, 1997
- [Sistemas] - Franz, J. Optical Communication Systems / J. Franz & V. Jain Academic Wiley, 1996
- [Sistemas] - WDM systems and networks : modeling, simulation, design and engineering / Neophytos (Neo) Antoniadis, Georgios Ellinas, Ioannis Roudas editors . New York : Springer, cop. 2012