Course guides
32094 - PHOTOLAB - Photonics Laboratory

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 731 - OO - Department of Optics and Optometry.

Degree: DOCTORAL DEGREE IN PHOTONICS (Syllabus 2007). (Optional subject).
DOCTORAL DEGREE IN OPTICAL ENGINEERING (Syllabus 2007). (Optional subject).
MASTER'S DEGREE IN PHOTONICS (Syllabus 2009). (Optional subject).
ERASMUS MUNDUS MASTER'S DEGREE IN PHOTONICS ENGINEERING, NANOPHOTONICS AND BIOPHOTONICS (Syllabus 2010). (Optional subject).

Academic year: 2015 ECTS Credits: 5.0 Languages: English

LECTURER

Coordinating lecturer: CRINA MARIA COJOCARU

Others: J. Trull, E. Perez, J. Lázaro, J. Prat (UPC)
G. Orriols, F. Pi, J. Campos (UAB)
I. Juvells, S. Vallmitjana (UB)

TEACHING METHODOLOGY

Presencial teaching + activities

LEARNING OBJECTIVES OF THE SUBJECT

"Photonics laboratory" aims to provide the students with an experimental overview over different phenomena and aspects of PHOTONICS that are theoretically studied in the different core and semi-core subjects. The course consists of 5 laboratory works of 8 hours, organized in weekly packets and devoted to different topics of basic and applied photonics. We offer a list of 13 topics. Each student will have to choose five laboratory works from this list, taking into account her/his preferences and availability of laboratories. Each topic will be covered in two lab sessions of 4 hours. Guidelines for each subject are available in ATENEA, aiming to provide the student with a broad overview on main sides of the topic: a phenomenological study, description and interpretation of a variety of phenomena that the student is supposed to observe in the lab, consolidation of basic theoretical concepts, manipulation of different experimental apparatus, definition of experimental objectives, etc. After the finalization of the work a written report has to be submitted.

CONTENTS

- Interference and coherence (1)
- Interference and coherence (2)
- Diffraction. Talbot effect
Polarization and polarizing materials

Light-matter interaction phenomena

Active and nonlinear optical media: lasers and second harmonic generation

Optical instruments

Photoemitters and photodetectors. Optical sensing for control and distance measurements.

Optical Image Processing

Optical fibers: hands-on and characterization

Optical fiber transmission: network and devices

Optical fiber communication systems (Erbium Doped Fiber Amplifiers)

Hands on image sensors

GRADING SYSTEM

- Evaluation of the 5 reports corresponding to the laboratory works done by the student (60%)
- Evaluation of individual student activity in the laboratory and previous preparation of the guidelines (40%).

EXAMINATION RULES.

The usual in university teaching

BIBLIOGRAPHY

Basic:
- Laboratory guidelines with the specific bibliography inside.