Course guides
32061 - OM - Optical Metrology

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: SANTIAGO ROYO ROYO
Others: FERRAN LAGUARTA BERTRAN - FIDEL VEGA LERIN

TEACHING METHODOLOGY

Presencial Teaching + Activities

LEARNING OBJECTIVES OF THE SUBJECT

Optical techniques offer a wide variety of solutions for the measurement of real-world problems. Non-contact in nature, a variety of measurement principles allows covering a broad range of measurement applications both in research and in industry. In this course, students will be provided with a practical and theoretical overview on the basics of optical metrology techniques. We will also review the different major families of techniques and applications which allow the measurement of different surface and material features. Finally students will be introduced to some relevant applications of optical metrology in the industrial and research fields.

CONTENTS

- Basic concepts involved in optical surface metrology. Surface characterization: shape

Full-or-part-time: 30 h
Theory classes: 26h
Practical classes: 4h

- Overview of surface metrology techniques: contact, SPM and optical sensors

- Advanced Optical Imaging Theory

- Single point techniques: triangulation, dynamic focusing, confocal, chromatic
### Imaging techniques: fringe projection, deflectometry, confocal, interferometry (PSI)

### Characterization of stratified media: Confocal. Interferometry. Reflectometry.

### Optical metrology of laser-induced photonics structures: mode beam propagation

### Fluorescence techniques. High lateral resolution arrangements: 4 Pi, STED

### Applications of optical metrology techniques

#### GRADING SYSTEM

Students will be assigned a number of tasks related to the contents of the course and their interests along the semester. This task will represent 60% of the total course evaluation.

- A final examination at the end of the semester for a 40% of the final mark.
- Optionally, students may choose at the beginning of the semester to be evaluated for a 100% weight in the final exam, avoiding the task assignments.

#### EXAMINATION RULES.

The usual in University teaching

#### BIBLIOGRAPHY

**Basic:**

**Complementary:**