Guía docente
32061 - OM - Metrología Óptica

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Unidad responsable: Escuela Técnica Superior de Ingeniería de Telecomunicación de Barcelona
Unidad que imparte: 731 - OO - Departamento de Óptica y Optometría.

Titulación: DOCTORADO EN FOTÓNICA (Plan 2007). (Asignatura optativa).
DOCTORADO EN INGENIERÍA ÓPTICA (Plan 2007). (Asignatura optativa).
MÁSTER UNIVERSITARIO EN FOTÓNICA (Plan 2009). (Asignatura optativa).
MÁSTER UNIVERSITARIO ERASMUS MUNDUS EN INGENIERÍA FOTÓNICA, NANOFOTÓNICA Y BIOFOTÓNICA (Plan 2010). (Asignatura optativa).

Curso: 2015 **Créditos ECTS:** 5.0 **Idiomas:** Inglés

PROFESORADO

Profesorado responsable: SANTIAGO ROYO ROYO

Otros: FERRAN LAGUARTA BERTRAN - FIDEL VEGA LERIN

METODOLOGÍAS DOCENTES

Presencial Teaching + activities

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

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.

CONTENIDOS

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

Dedicación: 30 h
Grupo grande/Teoría: 26h
Grupo mediano/Prácticas: 4h

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

(CAST) -Advanced Optical Imaging Theory

(CAST) -Single point techniques: triangulation, dynamic focusing, confocal, chromatic

(CAST) -Imaging techniques: fringe projection, deflectometry, confocal, interferometry (PSI,

(CAST) -Characterization of stratified media: Confocal. Interferometry. Reflectometry.

(CAST) -Optical metrology of laser-induced photonics structures: mode beam propagation

(CAST) -Fluorescence techniques. High lateral resolution arrangements: 4 Pi, STED

(CAST) -Applications of optical metrology techniques

SISTEMA DE CALIFICACIÓN

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.

NORMAS PARA LA REALIZACIÓN DE LAS PRUEBAS.

The usual in University teaching

BIBLIOGRAFÍA

Básica:
- Gasvik, K.J. Optical metrology. 3rd ed. Chichester: John Wiley & Sons, 2002. ISBN 9780470843000.
- Malacara, D. (ed.). Optical shop testing. 3rd ed. New York: John Wiley & Sons, 2007. ISBN 9780471484042.
- Cielo, P.G. Optical techniques for industrial inspection. Boston: Academic Press, 1988. ISBN 0121746550.
- Rastogi, P.K. (ed.). Optical measurement techniques and applications. Boston: Artech House, 1997. ISBN 0890065160.

Complementaria:
- Gu, M. Advanced optical imaging theory. Berlin: Springer, 2000. ISBN 3540662626.
- American Society of Mechanical Engineers. surface texture: surface roughness, waviness and lay. Standard B46.1-2002. New York, NY: ANSI/ASME Standard, 2003. ISBN 0791828018.