Course guides
32059 - OSD - Optomechanical Systems Design

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).
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: JOSE ARASA MARTI
Others: SALVADOR BOSCH

TEACHING METHODOLOGY
Presencial teaching + activities

LEARNING OBJECTIVES OF THE SUBJECT
The main objective is to introduce the student in the optical design's field. The course covers fundamental concepts as image formation, image quality and merit function definition. Advanced concepts as classical aberration theory, surfaces' influence in merit function and optimization processes and technological concepts as material selection and influences, buffering strategies or thermal mounting stress, are also addressed

CONTENTS

Imaging systems: basic relations between object and image, pupils.

Aberration theory. Diffractional limits and Seidel formulation. Use of pupil apodization filters.

Computing environments for optical design.

Computing optical properties: invariants, aberration coefficients, imaging performances.

Optomechanical characterization used in optical design process

Design vs Specify: The importance of paraxial optics, how translate the user's desires
A useful point of view of the wavefront (in the context of optical design) Useful analysis of some aspects of the wavefront

Conceptual design: Minimum information necessary to start a design & material selection

Computing tools: Introduction and use

Preliminary design: Variables types and uses

Designing process: Fields and apertures, Optimization and strategies

ISO 10110 and Tolerance Analysis

GRADING SYSTEM

- 30% written exam about theoretical topics
- 10% written exercises about theoretical topics
- 20% Personal design (your own optical design) write report
- 20% Review task of the others students, write report with marks
- 20% Public defense of your own optical design

EXAMINATION RULES.

The usual in University teaching

BIBLIOGRAPHY

Basic:

Complementary: