



Guía docente

32055 - NO - Óptica No Lineal

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Unidad responsable: Escuela Técnica Superior de Ingeniería de Telecomunicación de Barcelona
Unidad que imparte: 748 - FIS - Departamento de Física.

Titulación: DOCTORADO EN FOTÓNICA (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: Jose Trull
Otros: Crina Cojocar

METODOLOGÍAS DOCENTES

Presencial Teaching + activities

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

The course will render a basic overview on the field of nonlinear optics, starting from basic principles, in order to provide a sound background for the students interested in this field. The basic equations governing different nonlinear processes will be derived and detailed solutions will be discussed in the plane wave approach. The main aspects of nonlinear interactions with beams and pulses will be then considered in order to extend the basic formulation to more complex systems and interactions. The last part of the course aims to provide an overview in recent advances and state of the art of the field.

CONTENIDOS

(CAST) Slow light

(CAST) Solitons

(CAST) PC-resonators

(CAST) Other specific topics of current research interest (will vary depending on situation)

(CAST) Laser dynamics. Fundamentals of laser oscillation. Laser equations. Temporal dynamics of lasers

(CAST) Nonlinear spatio-temporal dynamics of optical systems



(CAST) Extended and localized spatio-temporal structures, vortices and solitons

(CAST) Specific topics of current research interest (will vary depending on situation)

(CAST) -

SISTEMA DE CALIFICACIÓN

- Course exam (50%): exam of the course contents by the end of the course
- Problem solving (40%): delivering of problem questionnaires to be solved by the student
- Oral exposition of selected work on recent nonlinear optics topics (10%)

NORMAS PARA LA REALIZACIÓN DE LAS PRUEBAS.

The usual in University teaching

BIBLIOGRAFÍA

Básica:

- Siegman, A.E. Lasers. Mill Valley, Calif.: University Science Books, 1986. ISBN 0935702113.
- Staliunas, K.; Sánchez-Morcillo, V.J. Transverse patterns in nonlinear optical resonators: with 132 figures. Berlin [etc.]: Springer, 2003. ISBN 3540004343.
- Resonators. Springer Verlag,
- Weiss, C.O.; Vilaseca, R. Dynamics of lasers. Weinheim [Germany] ; New York: VCH, 1991. ISBN 0895739666.
- Haken, H. Light. Amsterdam: North-Holland Publ. Co., 1981-1985. ISBN 0444860207 (V.1) ; 0444860215 (V. 2).