



Guía docente 32090 - INTEPH - Fotónica Integrada

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Unidad responsable: Escuela Técnica Superior de Ingeniería de Telecomunicación de Barcelona
Unidad que imparte: 10041 - UB-FQ - (CAS) pendent.

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:** 2.5 **Idiomas:** Inglés

PROFESORADO

Profesorado responsable: Blas Garrido

Otros: Sergi Hernández

METODOLOGÍAS DOCENTES

Presencial Teaching + activities

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

The objective of this course is to give in depth knowledge of devices that are basic components of integrated photonic integrated systems, including passive devices, active devices and photonic crystals. The fabrication processes, technology steps and designing tools will be described in detail. Emphasis in state of the art materials (Si or III-V compounds) will be made in the descriptions of photonics devices.

CONTENIDOS

(CAST) Passive integrated photonic components

(CAST) Waveguides (rib, strip-loaded, slot) and gratings

(CAST) Bends and Y-junctions

(CAST) Add/drop micro-rings

(CAST) Tapers, MMIs, MZI

(CAST) Design of passive components using FIMMWAVE®



(CAST) Active integrated photonic components

(CAST) Light sources: lasers and LEDs

(CAST) Optical amplifiers: waveguides and SOA

(CAST) Detectors for visible and infrared ranges

(CAST) Modulators

(CAST) Polarization splitters and rotators

(CAST) Devices with photonic crystals

(CAST) Integrated silicon micro and nanophotonics technology

(CAST) Technological platforms for photonic integrated circuits (PIC)

(CAST) Basic technology steps (deposition, lithography, etching)

(CAST) Silicon on Insulator (SOI) technology

(CAST) InP photonic integrated technology

(CAST) Photonic system on a chip

SISTEMA DE CALIFICACIÓN

- . Minimum attendance: 80 % of the lecture time.
- . Examination: The students prepare a presentation on a subject of the lecture. The presentation consists in a written part and in a 20 minutes presentation.



NORMAS PARA LA REALIZACIÓN DE LAS PRUEBAS.

The usual in University teaching

BIBLIOGRAFÍA

Básica:

- Pollock, C.R.; Lipson, M. Integrated photonics. Norwell: Kluwer Academic, 2003. ISBN 1402076355.
- Pollock, C.R. Fundamentals of optoelectronics. Boston: Richard D. Irwin, 1995. ISBN 0256101043.
- Yariv, A.; Yeh, P. Photonics: optical electronics in modern communications. 6th ed. Oxford: Oxford University Press, 2007. ISBN 9780195179460.
- Yariv, A.; Yeh, P. Optical waves in crystals: propagation and control of laser radiation. New York [etc]: John Wiley and Sons, 1984. ISBN 0471091421.
- Agrawal, G.P. Fiber-optic communication systems. 4th ed. Hoboken, New Jersey: Wiley, 2010. ISBN 9780470505113.
- Okamoto, K. Fundamentals of optical waveguides. 2nd ed. Burlington, MA [etc.]: Academic, 2006. ISBN 9780125250962.
- Hunsperger, R.G. Integrated optics: theory and technology. 6th ed. New York: Springer, 2009. ISBN 9780387897745.
- Iizuka, K. Elements of photonics (vol. 2). New York: Wiley-Interscience, 2002. ISBN 0471408158 (V.2).