Guia docent
32076 - AOI - Instrumentació Òptica Avançada

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Unitat responsable: Escola Tècnica Superior d'Enginyeria de Telecomunicació de Barcelona
Unitat que imparteix: 731 - OO - Departament d'Òptica i Optometria.

Titulació: **Curs:** 2015 **Crèdits ECTS:** 2.5
Idiomes: Anglès

PROFESSORAT

Professorat responsable: Montserrat Arjona

Altres: Josep Arasa

METODOLOGIES DOCENTS

Presencial Teaching + activities

OBJECTIUS D'APRENENTATGE DE L'ASSIGNATURA

The aim of the course is to offer an in-depth overview of optical instruments that are not usually considered basic, but the use of which, however, is essential in many industrial, metrological, control, and biomedical applications. The course begins with the definition of the additional optical parameters and the optical systems components that are needed to obtain an effective and operative description of the instruments. It goes on to analyse the function, the design and the characteristics of optical instruments which include elements such as: systems with a constant increase, telecentric systems, anamorphic systems. Finally, applications in which this type of advanced optical instruments making a special emphasis in Photomicrography and Specialized Optical Microscopy.

CONTINGUTS

Section 1: Introduction to the optical instruments.

Section 2: Importance of the diaphragms in the optical instruments.

Section 3: Non standard applications of optical components in the optical

Section 4: Photomicrography

Section 5: Specialized Optical Microscopy techniques

SISTEMA DE QUALIFICACIÓ

Two aspects are assessed: students' knowledge of the topics covered in the first part of the course and the assignment they have carried out.
The first evaluation involves a written test and the second the presentation of the assignment.

NORMES PER A LA REALITZACIÓ DE LES PROVES.

The usual in University teaching

BIBLIOGRAFIA

Bàsica:
- Smith, W.J. Modern optical engineering: the design of optical systems. 4th ed. New York [etc.]: McGraw-Hill, 2008. ISBN 9780071476874.
- Begunov, B.N. [et al.]. Optical instrumentation: theory and design. Moscow: MIR Publisher, 1988. ISBN 5030000089.
- Sirohi, R.S.; Kothiyal, M.P. Optical components, systems, and measurement techniques. New York [etc.]: Marcel Dekker, 1991. ISBN 0824783956.
- Rost, F.; Oldfield, R. Photography with a microscope. Cambridge: Cambridge Universal Press, 2000. ISBN 0521770963.
- Smith, R.F. Microscopy and photomicrography: a working manual. 2nd ed. New York: CRC Press, 1994. ISBN 0849386829.

Complementària:
- Shannon, R.R.; Wyant, J.C. Applied optics and optical engineering (vol. 10). San Diego [etc.]: Academic Press, 1987. ISBN 0124086101.
- Smith, G.; Atchison, D.A. The eye and visual optical instruments. Cambrige: Cambrige University, 1997. ISBN 0521478200.
- Mouroulis, P.; Macdonald, J. Geometrical optics and optical design. New York [etc.]: Oxford University Press, 1997. ISBN 0195089316.
- Bradbury, S. An introduction to the optical microscope. Rev. ed. Oxford ; New York: Oxford University Press, 1989. ISBN 0198564198.
- Abramowitz, M. Microscope: basics and beyond (vol. 1). Revised edition. Melville, NY: Olympus America, 2003.