

Course guide

220624 - 220624 - Photonics Sensors and Laser Technology

Last modified: 11/04/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 748 - FIS - Department of Physics.

Degree: MASTER'S DEGREE IN AUTOMATIC SYSTEMS AND INDUSTRIAL ELECTRONICS (Syllabus 2012). (Optional subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: Ramon Vilaseca Alavedra
Ferran Laguarta Bertran

Others:

TEACHING METHODOLOGY

-

LEARNING OBJECTIVES OF THE SUBJECT

-

STUDY LOAD

Type	Hours	Percentage
Hours large group	31,0	24.80
Hours medium group	14,0	11.20
Self study	80,0	64.00

Total learning time: 125 h

CONTENTS

-

Description:

-

Specific objectives:

-

Related activities:

-

Full-or-part-time: 11h

Theory classes: 2h

Practical classes: 1h

Self study (distance learning): 8h

-

Description:

-

Specific objectives:

-

Related activities:

-

Full-or-part-time: 25h

Theory classes: 4h

Practical classes: 2h

Laboratory classes: 3h

Self study (distance learning): 16h

-

Description:

-

Specific objectives:

-

Related activities:

-

Full-or-part-time: 25h

Theory classes: 4h

Practical classes: 2h

Laboratory classes: 3h

Self study (distance learning): 16h

-

Description:

-

Specific objectives:

-

Related activities:

-

Full-or-part-time: 17h

Theory classes: 3h

Practical classes: 1h

Laboratory classes: 3h

Self study (distance learning): 10h



-

Description:

content english

Specific objectives:

-

Related activities:

-

Full-or-part-time: 47h

Theory classes: 8h

Practical classes: 4h

Laboratory classes: 5h

Self study (distance learning): 30h

ACTIVITIES

name english

Description:

-

Specific objectives:

-

Material:

-

Delivery:

-

Full-or-part-time: 45h

Theory classes: 20h

name english

Description:

-

Specific objectives:

-

Material:

-

Delivery:

-

Full-or-part-time: 34h

Theory classes: 7h

Laboratory classes: 2h



name english

Description:

-

Specific objectives:

-

Material:

-

Delivery:

-

Full-or-part-time: 17h

Laboratory classes: 12h

name english

Description:

-

Specific objectives:

-

Material:

-

Delivery:

-

Full-or-part-time: 29h

Theory classes: 4h

GRADING SYSTEM

-

EXAMINATION RULES.

-

BIBLIOGRAPHY

Basic:

- Hecht, Eugene. Óptica [on line]. 5ª ed. Madrid: Pearson, 2017 [Consultation: 20/09/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6557. ISBN 9788490354926.
- Albella, J.M.; Martínez-Duart, J.M.; Agulló-Rueda, F. Fundamentos de microelectrónica, nanoelectrónica y fotónica. Madrid: Prentice Hall, 2005. ISBN 8420546518.
- Uiga, Endel. Optoelectronics. Englewood Cliffs (N.J.): Prentice-Hall, cop. 1995. ISBN 0024221708.
- Friedman, E.; Miller, J.L. Photonics rules of thumb: optics, electro-optics, fiber optics, and lasers. 2nd ed. New York: McGraw-Hill, cop. 2004. ISBN 0071385193.
- Hecht, Jeff. Understanding lasers: an entry-level guide. 3rd ed. Hoboken, NJ: Piscataway, NJ: John Wiley & Sons; IEEE Press, 2008. ISBN 9780470088906.
- Steen, W. M.; Mazumder, J. Laser material processing. 4th ed. New York: Springer, 2010. ISBN 9781849960618.

Complementary:

- Saleh, B.E.A.; Teich, M.C. Fundamentals of photonics. 2nd ed. New York: John Wiley & Sons, 2007. ISBN 9780471358329.
- Hitz, C.B.; Ewing, J.J.; Hecht, J. Introduction to laser technology. 3rd ed. Piscataway, NJ: IEEE Press, cop. 2001. ISBN 0780353730.
- Pinson, L.J. Electro-optics. New York: John Wiley & Sons, 1985. ISBN 0471881422.
- Wolfe, W.L. Introduction to radiometry. Bellingham, Wash.: SPIE Optical Engineering Press, cop. 1998. ISBN 0819427586.
- Powell, John. CO2 laser cutting. 2nd ed. London [etc.]: Springer-Verlag, 1998. ISBN 1852330473.