Program	09TT- Engineering in Telecommunication Technologies and Services

Course number and name

Number	95000036
Name	Optical Communications Comunicaciones Ópticas
Semester	Y3-S6

Credits and contact hours

ECTS Credits	4.5
Contact hours	48

Coordinator's name	Francisco J. López Hernández

Specific course information

Description of course content

A course on the constituent blocks of an optical communication system, both from the perspective of the specific devices or seen as a communication system: transmitters, receivers, optical circuits, modulation schemes, etc.

The experimental part should help the student feel confident about basic elements of optical communications: optical fiber, connectors, power measurement and levels, couplers, optical filters, etc.

List of topics to be covered

Theory:
1. Introduction to optical communication systems, 2. Optical devices, 3. Optical fiber, 4. Optical emitters, 5. Receivers and Sensitivity.

Laboratory:
1. Basic elements of an optical link, 2. Characterization of optical sources, 3. Time and power budget, 4. Characterization of a digital system with its passive devices.

Prerequisites or co-requisites

Students should have a background in general physics, electronics, signals and systems, communication theory, fields and waves in telecommunication, and transmission systems.

Course category in the program

X R (required)	__ E (elective)	__ SE (selective elective)

Specific goals for the course

Specific outcomes of instruction

RA63 - Ability for applying the basic techniques in telecommunication networks, services and applications, both in infrastructure or mobile environments.
RA64 - Ability of analysing devices and their specifications to be used in wired and wireless optical communication systems.
RA66 - Ability for the selection of antennas, equipment and transmission systems, guided and unguided wave propagation, by electromagnetic means, radiofrequency o optical.
RA69 - Knowledge of infrastructures for trunks, metro and access communication networks, optical networks and high rate links
RA315 - Ability for the design, analysis, and characterization of optical communication networks as a transmission system.
RA316 - Ability of using basic instruments for the characterization of optical communication systems.
RA317 - Knowledge and understanding attenuation, dispersion, and waveguiding in optical fibres.
RA321 - Capacity for the analysis of passive optical devices and their selection
RA323 - Capacity for the analysis of optical transmission and detection optical devices and their selection

Student outcomes addressed by the course
CE-ST2, CE-ST3, CE-ST5 CG2, CG7, CG8

Bibliography and supplemental materials
- Agrawal, G.P. "Fiber-Optic Communication Systems" Fiber-Optic Communication Systems, Wiley Interscience (2010). - Agrawal, G.P. "Lightwave Technology: Telecommunication Systems" Fiber-Optic Communication Systems, WileyInterscience (2005). - Martín Pereda, J.A. "Sistemas y Redes Ópticas de Comunicaciones", PearsonPrentice Hall (2004). - Keiser, Gerd; "Optical Fiber Communications", McGraw-Hill (2010). - Senior, J. M. "Optical Fiber Communications", Prentice Hall, (2009). - Conceptos fundamentales de Comunicaciones Ópticas: Guía de prácticas. Departamento de Tecnología Fotónica y Bioingeniería (2014).

Teaching methodology			
_X_ lectures	_X_ problem solving sessions	_X_ collaborative actions	X_ laboratory sessions
Other:			