

Program	09TT- Engineering in Telecommunication Technologies and Services
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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
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Specific course information		
Description of course content		
<p>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.</p> <p>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.</p>		
List of topics to be covered		
<p>Theory:</p> <ol style="list-style-type: none"> 1. Introduction to optical communication systems, 2. Optical devices, 3. Optical fiber, 4. Optical emitters, 5. Receivers and Sensitivity. <p>Laboratory:</p> <ol style="list-style-type: none"> 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		
<p>Students should have a background in general physics, electronics, signals and systems, communication theory, fields and waves in telecommunication, and transmission systems.</p>		
Course category in the program		
<input checked="" type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input type="checkbox"/> 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 or 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

<u> </u> X lectures	<u> </u> X problem solving sessions	<u> </u> X collaborative actions	<u> </u> X laboratory sessions
Other:			