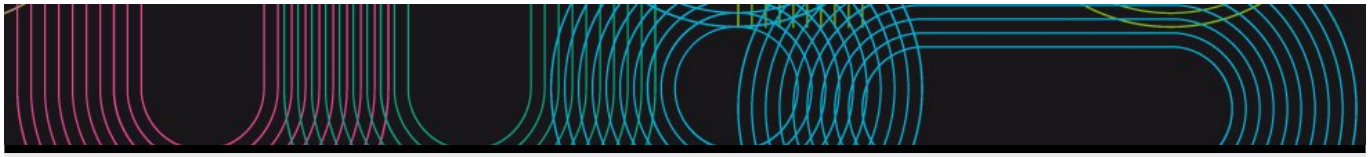

IDENTIFYING DATA				
Optical Communications				
Subject	Optical Communications			
Code	O01M117V01202			
Study programme	(*)Máster Universitario en Fotónica e Tecnoloxías do Láser			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	1st	2nd
Teaching language	Spanish			
Department				
Coordinator	Michinel Álvarez, Humberto Javier			
Lecturers	Fraile Peláez, Francisco Javier Michinel Álvarez, Humberto Javier			
E-mail	hmichinel@uvigo.es			
Web	http://laserphotonics.org			
General description	Optical communications is a subject that comprises the study of components, means of transmission and technical used for the communications in optical bands. Such descriptive generality allows practically any election of approach and educational contents for the same. Like this, in the ruled education, under the title optical communications can find , from physical ""approaches"", with a heavy load of electromagnetic theory, integrated optics, optoelectronical, etc., until approaches almost purely descriptive of a conceptual level very superficial.			

Competencies	
Code	
C2	Ability to analyze, design and application of computational methods, nonlinear systems, numerical methods, numerical modeling, simulations, algorithms, and specific software for use in photonics and laser technologies.
C5	Capacity for understanding and classification of optical communication systems, exploring the transmission and propagation of light in optical fibers and optical identification of sources, integrated optical devices, and digital and analog systems.
D1	Leadership skills, decision making and time management.

Learning outcomes	
Expected results from this subject	Training and Learning Results
(*)Knowledge of the basic elements of *fotodetección and the problems of fidelity and applicable noise to the transmission by optical fibre.	C2
(*)Knowledge of the operation of the lasers of semiconductor and of the modulators *electroópticos regarding his application in systems of transmission by optical fibre	C5
(*)Capacity of critical analysis of the existent technical problems in the industrial states involved.	D1

Contents	
Topic	
INTRODUCTION	Maxwell equations in dielectrics Wave equation in dielectrics. Index of refraction and losses Solution of the wave equation in step guides TE and TM modes Modal power

PROPAGATION OF PULSES IN OPTICAL FIBRES	Estimate of the broadening of pulses Propagation of gaussian pulses: broadening; limit to the binary speed Minimization of the dispersion in monomode fibers: suppression of the dispersion of prime importance; compensation between different fibers Other types of dispersion; discussion of the linear character of the optical link
DETECTION OF THE LUMINOUS RADIATION	Introduction. Photonic noise. Quantum efficiency, answer and equivalent power of noise Receptors with photodiodes p-i-n and APD. Probability of error. Foundation of the coherent reception
LIGHT SOURCES	Lasers of semiconductor. Modulation and noise. Chirp. Optical amplifiers of fibre doped and of semiconductor
SPECIAL DEVICES OF INTEGRATED OPTICS AND FIBERS. PASSIVE COMPONENTS	Anisotropic propagation and electrooptic effect External modulation of the laser Linear directional coupler Applications of the linear directional coupler: optical distributor; resonant devices with fibers Other devices: unions and connectors; optical insulators, tunable filters, (de)multiplexers, etc.

Planning

	Class hours	Hours outside the classroom	Total hours
Troubleshooting and / or exercises	10	0	10
Autonomous troubleshooting and / or exercises	0	100	100
Master Session	38	0	38
Multiple choice tests	2	0	2

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Troubleshooting and / or exercises	Resolution in the kind of *boletines of problems realized.
Autonomous troubleshooting and / or exercises	Resolution of of *boletines of problems realized of autonomous way pole student
Master Session	Explanation put professor of the basic concepts of the *asignatura

Personalized attention

Methodologies	Description
Autonomous troubleshooting and / or exercises	Periodic delivery of *boletines of problems realized of autonomous way

Assessment

	Description	Qualification	Training and Learning Results
Autonomous troubleshooting and / or exercises	Periodic delivery of *boletines of problems realized of autonomous way	50	
Multiple choice tests	Examination type test with questions of multiple options.	50	

Other comments on the Evaluation

Sources of information

Recommendations