



IDENTIFYING DATA

Industrial Applications of Lasers

Subject	Industrial Applications of Lasers			
Code	001M117V01203			
Study programme	(*)Máster Universitario en Fotónica e Tecnoloxías do Láser			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	1st	2nd
Teaching language				
Department				
Coordinator	Michinel Álvarez, Humberto Javier			
Lecturers	Michinel Álvarez, Humberto Javier Nicolás Nicolás Costa, Ginés Yáñez Casal, Armando			
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Web	http://laserphotonics.org			
General description	This matter poses a review of the industrial applications of the laser, mainly those related with the processed of materials.			
	The approach of the subject is very descriptive in the theoretical sessions since it pretends achieve that the student purchase a wide vision of the applications and of the systems that are appropriate for each one of them.			

Competencies

Code	
B3	Capacity for planning research activities, development and innovation in research institutions, technology and companies in all fields related to photonics and laser technologies.
C1	Ability to understand the physical basis of the applications of lasers in various fields of particular relevance, such as metrology , biomedicine, industry and environment . Identification and recognition of new technologies, applications, business systems, regulations on lasers and the development of processes and systems for analysis.
D2	Ability to work in multidisciplinary and multilingual teams, in an international context.
D3	Skill in interpersonal relationships.
D6	Concern for quality and continuous improvement.

Learning outcomes

Expected results from this subject	Training and Learning Results
New	
Knowledge of the distinct industrial processes.	C1
Knowledge of the systems suitable laser to each process.	B3
Development of industrial processes.	D6
Establishment of the feasibility of a process.	D3
Security laser in industry	D2

Contents

Topic

Materials processing with laser	Introduction to materials processing with laser Laser systems for material processing Optical Systems Components of systems for material processing with lasers
Applications of the interaction of the laser with materials	Surface treatments Welding Cutting and drilling Industrial applications of laser ablation
Working safety in laser facilities	Risks in laser facilities legislation and norms in industrial facilities laser safety

Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	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
Laboratory practises	(*)Os alumnos realizarán experiencias no laboratorio sobre os conceptos fundamentais da asignatura
Autonomous troubleshooting and / or exercises	(*)O alumno resolverá de xeito autónomo os problemas e exercicios propostos polo profesor da asignatura
Master Session	(*)O profesor exporá os principais conceptos da asignatura co apoio do material docente que estime oportuno a empregar na clase

Personalized attention

Methodologies	Description
Autonomous troubleshooting and / or exercises	

Assessment

	Description	Qualification	Training and Learning Results
Autonomous troubleshooting and / or exercises	(*)Entrega periódica de boletines de problemas realizados de xeito autónomo	50	
Multiple choice tests	(*)Examen tipo test con preguntas multiopción.	50	

Other comments on the Evaluation

Sources of information

John F. Ready, **Handbook of laser materials processing**, : Laser Institute of America,
Sune Svanberg, **Atomic and molecular spectroscopy : basic aspects and practical applications**, Springer-Verlag,
Jacques Ludman, H. John Caulfield, Juanita Riccobono, **Holography for the new millennium**, Springer-Verlag,

Recommendations