



INSTITUTO DE FÍSICA
FACULTAD DE FÍSICA

COURSE	:	APPLICATIONS OF PULSED LASERS IN TRANSIENT PLASMAS
DIAGNOSTIC	:	
TRANSLATION	:	APLICACIONES DE LASERES PULSADOS EN DIAGNOSTICO DE PLASMAS
TRANSIENTES	:	
NUMBER	:	FIM3004
CREDITIS	:	15 UC / 9 SCT
MODULES	:	4
REQUISITE	:	FIM8310, FIM8320
CONECTOR	:	AND
RESTRICTIONS	:	030401, 030501
CHACRACTER	:	OPTATIVE
FORMAT	:	THEORETICAL LECTURES, LABORATORY
QUALIFICATION	:	STANDARD
FORMATIVE LEVEL	:	DOCTORATE
DISCIPLINE	:	PHYSICS

I. COURSE DESCRIPTION

In this course the student acquires the physical and technological foundations of operation and functioning of pulsed lasers and develops applications to the diagnosis of Transient Plasmas.

II. LEARNING OUTCOMES

1. Know the principles of operation of pulsed lasers with crystalline active medium.
2. Develop the ability to operate pulsed lasers, including optical and electronic adjustments.
3. Apply pulsed lasers in the optical diagnosis of transient plasmas.

III. CONTENT

1. Nd: YAG laser fundamentals.
2. Optical cavity alignment.
3. Operation in Q-switch mode
4. Determination of longitudinal and transversal coherence.
5. Second harmonic generation.
6. States of polarization.
7. Pulse compression.
8. Separation and transport of laser beams.
9. Optical mounts for plasma imaging: schlieren and shadowgraphy.
10. Optical assemblies for plasma interferometry: Mach-Zehnder and holographic.
11. Polarimetry.

IV. METHODOLOGICAL STRATEGIES

- Personal reading
- Practical work
- Tutorships

V. EVALUATIVE STRATEGIES

- Reports
- Exhibition seminars



INSTITUTO DE FÍSICA
FACULTAD DE FÍSICA

IV. BIBLIOGRAPHY

REQUIRED

- | | |
|------------------|--|
| Hutchinson, I.H. | Principles of Plasma Diagnostics, Cambridge University Press, 2005. |
| Hariharam, P. | Optical Interferometry, Elsevier Science, 2003. |
| Koechner, W. | Solid State Laser Engineering, Springer Series in Optics, 2006 |
| Kreis, K. | Handbook of Holographic Interferometry: Optical and Digital Methods, Wiley VCH, 2005. |
| Weber, H. | Laser Resonators and Beam Propagation: Fundamentals, Advanced Concept and Applications, Springer Series in Optical Sciences, 2005. |

—
OPTIONAL

N/A