



INSTITUTO DE FÍSICA
FACULTAD DE FÍSICA

COURSE	:	ADVANCED TOPICS ON RELATIVITY AND FIELD THEORY
TRANSLATION	:	TOPICOS AVANZADOS DE RELATIVIDAD Y TEORIA DE CAMPOS
NUMBER	:	FIM3410
CREDITS	:	15 UC/ 9 SCT
MODULES	:	2
REQUISITES	:	FIM4545, FIM8530
CONECTOR	:	AND
RESTRICTIONS	:	030401, 030501
CHARACTER	:	OPTATIVE, THEORETICAL VARIANT
FORMAT	:	THEORETICAL LECTURE
QUALIFICATION	:	STANDARD
FORMATIVE LEVEL	:	DOCTORATE
DISCIPLINE	:	PHYSICS

I. DESCRIPTION

In this course, various advanced aspects of relativity and field theory are studied. This course is framed within the context of string theory, although some applications to cosmology will also be studied.

II. LEARNING OUTCOMES

- (1) Familiarize the student with advanced aspects of General Relativity, classical field theory, and topological theories.
- (2) Provide a background so that the student can then take advanced courses in string theory.

III. CONTENT

- 1. Quantization of gauge theories. Gravitation actions, strings, Chern-Simons and Yang-Mills
- 2. Quantum Field Theory in three dimensions: Chern-Simons, Kac-Moody algebras, Virasoro. The AdS3 / CFT2 correspondence. The Drinfeld-Sokolov reduction.
- 3. Field theory in two dimensions. Cardy's formula. Applications to black holes. Liouville theory.

IV. METHODOLOGICAL STRATEGIES

- Lecture classes

V. EVALUATIVE STRATEGIES

- There will be at least three explosions per student (100%)

VI. BIBLIOGRAPHY

REQUIRED

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|-----------------------------------|---|
| Green, M., Schwarz, J. Witten, E. | Superstrings. Cambridge U. Press, 1987 |
| M.Henneaux, C.Teitelboim | Quantization of gauge systems. Princeton U. Press, 1992 |
| P. Di Francesco, P. Mathieu, D. | Conformal Field Theory. Sénéchal, Springer 1997. |



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OPTIONAL

N/A