

60037 - Interaction of radiation and matter

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	538 - Master's in Physics and Physical Technologies
ECTS	5.0
Course	1
Period	First semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The program of this course aims to provide students with a theoretical specialization in the interactions between radiation and matter. By scheduled activities will attempt to encourage students with their continued active involvement in the different subjects. The main activities training course include: lectures, problem solving and discussions (3 + 1 ECTS); study and presentation of selected articles from the field (1 ECTS). These activities allow students to acquire the desired knowledge in theory and applications of the interaction of radiation with the matter and become familiar with problem-solving skills.

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5.2.Learning activities

1. Lectures on the fundamentals of the theory of radiation and matter.
2. Sessions interactive tutorials with solving problems in class
3. Personal student work solving problems.
4. Study, oral presentations and discussion of selected articles.

5.3.Program

1. Relativistic electrodynamics.
2. Lorenz and spin symmetries.
3. Classical Theory of Radiation. Synchrotron radiation.
4. Radiation through matter. Cerenkov effect.
5. Relativistic Quantum Mechanics.
6. Dirac equation and its applications (graphene Quantum Hall Effect, Topological Insulators).
7. Quantum Theory of Radiation.
8. Perturbation Theory.
9. Fermi's golden rule. Compton effect.
10. Interaction of radiation with non-relativistic matter.
11. Photoelectric effects and Rayleigh.

5.4.Planning and scheduling

The final schedule is pending. It will be announced well in advance.

5.5.Bibliography and recommended resources