26921 - Quantum Physics I

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	447 - Degree in Physics
ECTS	7.0
Course	3
Period	First semester
Subject Type	Compulsory
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 learning process of this subject has been designed on the following bases:

The suggested teaching-learning methodologies in order to reach the proposed objectives and acquiring the competences are:

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* Master classes, present to the students the basic theoretical knowledge to reach themselves the associated technical competences (CE1, CE2, CE3, CE4, CE5, CE6, CE10).

* Solving problems. That allows the acquistion of the technical competences from a practical point of view (CE1, CE2, CE3, CE5, CE6, CE10).

* Laboratory experiments. That allows the acquistion of the technical competences from a practical point of view (CE7, CE8, CE9).

* Examination covering the whole matter, to evaluate the degree of acquisition of all competences and objectives.

The competences CE are defined in the "memoria de verificación" (verification memory) for the "Grado en Física" (Grade in Physics), what can be seen in

http://ciencias.unizar.es/aux/generalDcha/EEES/MemVerifFisicaANECA.pdf

5.2.Learning activities

5.3.Program

0. Introduction. ¿What is, and why to study Quantum Physics?

1. Origin of the Quantum Theory. Corpuscular properrties of waves.

2. Wave properties of free particles. Atomic models and the de Broglie hypothesis.

3.Particles under external conservative forces. The Srödinger equation.. Some simple examples in 1D.

4. The quantum harmonic oscillator.

5. The Dirac formalism. Soace of states. Kets and bras. The posutulates of Quantum mechanics.

6. Physical contents of the formalism.

7. Angular moment. Central potentials. Hydrogen atom.

8. Addition of angular momenta. Clebsch-Gordan coeficients.

5.4.Planning and scheduling

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The distribution of the different programmed activities, acocordint to the credits is as follows:

Face sessions. 60 face sessions will be held. 45of them corresponding the activity "Acquisition of knowledge on the subject",

and 15 corresponding to thefarmtive activity "Solving problems related to the contents of the subject.". 3 laboratory sessions

will be held, corresponding to the formative activity "Observation, analysis and experimental measurement of quantum phenomena",

including 10 hours of non-face work. The prpeparation of report about the experiments in the laboratory will take 14 hours approximately.

The remaining non-face work of the subject (solving problems and studying) is estimated in about 87 total hours. The examination will be held on the date selected by the "Facultad de Ciencias" (Faculty of Science).

5.5.Bibliography and recomended resources

The updated bibliography is incorporated through the Centre Library and can be consulted on line (include link in the htm file, please)

http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=26921