UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Meccanica Quantistica

2122-3-E3001Q072

Aims

Introduction to the principles of Quantum Mechanics

Contents

Fundaments of Quantum Mechanics: Schrödinger equation and its probabilistic interpretation, fundamental quantum system (quantum harmonic oscillator, hydrogen atom,....), spin and identical particles, perturbation theory.

Detailed program

The crisis of Classical Physics.

The Schrödinger equation and its probabilistic interpretation.

Heisenberg uncertainty relations.

General properties of the Schrödinger equation.

The general principles of quantum mechanics.

Unidimensional problems, the harmonic oscillator.

Angular momentum and spin.

Tri-dimensional problems.

Motion in a central potential; the hydrogen atom.

Interaction with a classic electromagnetic field.

Identical particles.

Perturbation theory.

Prerequisites

Knowledge of Classical Physics and Mathematical Methods for Physics at the level of the first two years of the bachelor degree.

Teaching form

Lessons, 12 credits

Textbook and teaching resource

C. Cohen-Tannoudji, B. Diu, F. Laloe, “Quantum Mechanics” vol I e II

D.J. Griffiths, “Introduction to Quantum Mechanics”

S. Gasiorowicz, "Quantum Physics", III ed

J.J. Sakurai, J. Napolitano, “Modern Quantum Mechanics”

L.D. Landau, E.M. Lifshitz, “Quantum Mechanics”

R.P. Feynman, R.B. Leighton, M. Sands, "The Feynman Lectures on Physics", Vol III. Free access website http://www.feynmanlectures.caltech.edu

S. Forte, L. Rottoli "Fisica Quantistica"

Semester

First semester

Assessment method

The exam consists of a **written** (**exercises**) and **oral part**. The **oral part** concerns the **entire program**, including **exercises** and **applications**.

During the course, two optional intermediate written exams will be proposed. If both of them are passed, the final written exam is waived.

The exam has to be completed during the breaks according to the following:

1) the oral part of the two optional intermediate written exams or of the written test of the exam sessions of January and February has to be given before the end of the February exam session .

2) the oral part of the written test of the exam sessions of June and July has to be given before the end of the July exam session .

3) the oral part of the written test of exam session of September has to be given in that exam session.

Office hours

On student request, at agreed time