



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Quantum Mechanics

2021-3-E3001Q072

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#### Aims

Introduction to Quantum Mechanics

#### Contents

Fundamentals of Quantum Mechanics

#### 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

Introduction to Relativistic Quantum Mechanics

Quantization of the electromagnetic field

## **Prerequisites**

Good knowledge of Classical Physics

## **Teaching form**

Lessons, 12 credits

*Due to Covid-19 restrictions, lectures will be streamed and registered for asynchronous access.*

*Discussion and question sessions will be organised.*

## **Textbook and teaching resource**

D.J. Griffiths, "Introduction to Quantum Mechanics"

S. Forte, L. Rottoli "Fisica Quantistica"

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S. Gasiorowicz, "Quantum Physics", III ed

J.J. Sakurai, J. Napolitano, "Modern Quantum Mechanics"

L.D. Landau, E.M. Lifshitz, "Quantum Mechanics"

F. Schwabl, "Quantum Mechanics"

"The Feynman Lectures on Physics", Vol III. Free access website <http://www.feynmanlectures.caltech.edu>

## **Semester**

First semester

## **Assessment method**

Written and oral examination

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

*Due to Covid-19 restrictions written and oral examination will be web based:*

*written examinations will be on the platform*

<https://esamionline.elearning.unimib.it/>

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## **Office hours**

On student request, at agreed time

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