

# MATERIALS ENGINEERING AND NANOTECHNOLOGY (LM56)

(Lecce - Università degli Studi)

## Insegnamento PHYSICS OF MATTER MOD. I C.I.

GenCod A003097

**Docente titolare** ELEONORA ALFINITO

**Insegnamento** PHYSICS OF MATTER  
MOD. I C.I.

**Insegnamento in inglese** PHYSICS OF  
MATTER MOD. I (Int)

**Settore disciplinare** FIS/03

**Corso di studi di riferimento**  
MATERIALS ENGINEERING AND

**Tipo corso di studi** Laurea Magistrale

**Crediti** 6.0

**Ripartizione oraria** Ore Attività frontale:  
54.0

**Per immatricolati nel** 2015/2016

**Erogato nel** 2015/2016

**Anno di corso** 1

**Lingua**

**Percorso** PERCORSO COMUNE

**Sede** Lecce

**Periodo**

**Tipo esame** Orale

**Valutazione**

**Orario dell'insegnamento**  
<https://easyroom.unisalento.it/Orario>

### BREVE DESCRIZIONE DEL CORSO

This is a course in theory and models in physics of matter; it aims to furnish some basic knowledge concerning quantum physics of atoms, molecules and solids.

### PREREQUISITI

Sufficiency in calculus, probability theory, linear algebra, electromagnetism

### OBIETTIVI FORMATIVI

Learning Outcomes; after the course the student should be able to

\*Solve basic problems in special relativity

\*Solve basic problems in quantum mechanics

\*Be able to recognize the validity range of classical mechanics and use, whenever necessary, the achievement of modern physics

### MODALITA' D'ESAME

**test:**

Physics of matter I is only the first modulus of the complete course named Physics of matter.

There is a single final exam which includes the contents of modulus I and modulus II

The exam consists of two cascaded parts:

the first part is written test (duration: two hours and a half); the student is asked to solve exercises; it is aimed to verify to what extent the student has gained the ability to apply theory to solve simple case studies;

the second part is an oral test aimed to determine to what extent the student has gained an overall knowledge of the main topics of the course.

### ALTRE INFORMAZIONI UTILI

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## PROGRAMMA ESTESO

Introduction: Physics and technology from the end of 1800 to today (3 hours). Mechanical and electromagnetic waves (2 hours). Special relativity (5 hours). Elements of probability and the Maxwell distribution (5 hours). The quantum nature of light (5 hours). Atomic models and the matter wave (5 hours). Quantum mechanics in one dimension (12 hours). The angular momentum (5 hours). The hydrogen atom, eigenvalues and eigenfunctions (3 hours). Quantum statistics (2 hours). Multielectron atoms (2 hours). Introduction to molecules (5 hours).

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## TESTI DI RIFERIMENTO

- [1] R. Eisberg, R. Resnick, "Quantum Physics", J. Wiley and Sons.
- [2] R.A. Serway, C. J. Moses, C. A. Mojer, "Modern Physics", Saunders College
- [3] M. Born, "Atomic Physics", Dover Books on Physics
- [4] R. Gautreau, W. Savin, "Schaum's Theory and Problems in Modern Physics"