

MATERIALS ENGINEERING AND NANOTECHNOLOGY (LM56)

(Lecce - Università degli Studi)

Insegnamento PHYSICS OF MATTER MOD. I C.I.

GenCod A003097

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 2019/2020

Erogato nel 2019/2020

Anno di corso 1

Lingua INGLESE

Percorso PERCORSO COMUNE

Docente ELEONORA ALFINITO

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

Knowledge and understanding

The course provides a basis and an opportunity for originality in developing or applying ideas in a material physics research context .

Applying knowledge and understanding:

The course provides abilities in problem solving applied in new or unfamiliar environments within classical and quantum physics contexts .

Making judgements:

The course gives the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete data to discriminate between the classical and quantum regime, to evaluate the appropriate set of approximations to be used.

Communication

Students have to be able to communicate their conclusions and rationale to specialist , by using a technical language based on formulas and theorems, and non-specialist audiences by using a narrative language based on elementary concepts.

Learning skills

Students are trained to develop creative thinking, critical spirit, and autonomy , by using as a knowledge technique examples and counter-examples. The theoretical approach of the course is a good tool to improve their ability of abstraction

METODI DIDATTICI teacher-led discussion and assignments

MODALITA' D'ESAME

Physics of matter I is only the first modulus of the complete course named Physics of matter. There 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 tecnology 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 (3hours). Quantum statistics (2 hours). Multielectron atoms (2hours). Introduction to molecules (5 hours).

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 Problema in Modern Physics"