

## COURSE SYLLABUS

### Complements of Atomic and Molecular Physics

2122-3-E2701Q061

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#### Aims

The aims of this course are to give a first introduction to the classical and quantum statistical mechanics and to provide solid bases of molecular physics also through the theory of finite groups.

#### Contents

Elements of classical and quantum statistical mechanics. Introduction to group theory with applications to the study of electronic and vibrational states of polyatomic molecules. Simple molecules: electronic, rotational and vibrational structure.

#### Detailed program

1) (KK) chapters 2, 3, 5, 6, 7:

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## **Prerequisites**

The contents of the mathematics and physics courses of the first two years and of the previous Structure of Matter courses.

## **Teaching form**

Lectures (in Italian). Textbooks and additional materials may be in both Italian and English.

## **Textbook and teaching resource**

Suggested textbooks::

(KK) C. Kittel e H. Kroemer, Termodinamica Statistica, Boringhieri (Torino 1985) or the English version, Thermal Physics (W. Freeman, 1980).

(AF) P.W. Atkins and R. S. Friedman, Molecular Quantum Mechanics (5th edition), Oxford University Press (Oxford, 2011); P.W. Atkins and R. S. Friedman, Molecular Quantum Mechanics, Meccanica Quantistica Molecolare (Zanichelli, 2000).

(BJ) B.H. Brandsen e C.J. Joachain, Physics of Atoms and Molecules, Prentice Hall, 2003

Reccomended books for more informations.

S.J. Blundell and C. Blundell, "Concepts in Thermal Physics" (Oxford University Press, 2009)

D.C. Harris and M. D. Bertolucci, Symmetry and Spectroscopy (Dover, 1989)

## **Semester**

Second semester.

## **Assessment method**

The exam consists of a written test and an oral interview. There are no ongoing tests.

## Office hours

Every day by appointment.

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