UCL Université catholique de Louvain

LPHY1341

2010-2011

Atoms and molecules

4.0 credits	30.0 h + 10.0 h	2q

Teacher(s) :	Nauts André ; Defrance Pierre ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	Part I Physics of atoms -The structure of atoms and ions is based on a brief review of some relevant results of quantum mechanics and spectroscopy -Hydrogenoid systems, quantum defect -Many-electron atoms : Hartree-Fock method and Self-Consistent-Field approximation, central field and corrections, coupling schemes, isoelectronic series Part II Molecular Physics -Born-Oppenheimer approximation. -Electronic states: adiabatic states, molecular orbitals, terms -Symmetries and correlation diagrams of diatomic molecules -Vibrational and rotational states -Radiative transitions, selection rules -Introduction to molecular dynamics NB: An introduction to various illustrations by means of user-friendly computer codes in atomic and molecular structure and dynamics is provided during the supervised practical works.
Aims :	The objective of the course is to present the fundamental aspects of the structures and properties of atoms, ions and diatomic molecules. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Other infos :	Prerequisite : basic courses in physics and quantum mechanics
Cycle and year of study :	> Bachelor in Physics > Bachelor in Geography : General > Bachelor in Economics and Management > Bachelor in Mathematics > Bachelor in Engineering
Faculty or entity in charge:	PHYS