UCL Université catholique de Louvain

LPHY2342

2010-2011

Condensed Matter

5.0 credits	45.0 h + 10.0 h	2q

Teacher(s) :	Rignanese Gian-Marco ; Piraux Luc ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	Short overview of chemical bonding in solids, periodic crystal structures, reciprocal lattice Thermal properties : lattice dynamics, specific heat capacity, Debye model, phonons, effects due to anharmonicity Quantum states of electrons in solids : Bloch theorem, electronic band structure (the nearly free electron approximation, the tight binding approximation), Brillouin zone, Fermi surface, motion of electrons, effective mass The free electron gas :occupation of states, electronic specific heat, thermodynamical functions,) Semiconductors : carrier charge density, impurity levels, the p-n junction, transistor Transport phenomena : Boltzmann equation, electrical and thermal conductivities, electron-phonon collisions, Hall effect. Superconductivity : fundamental phenomena, London equations Methods : Ex-cathedra courses, exercises.
Aims :	This module gives an account of the essential elements of solid state physics *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".*
Cycle and year of study :	> Bachelor in Physics > Bachelor in Geography : General > Bachelor in Economics and Management > Bachelor in Mathematics > Bachelor in Engineering > Master [120] in Physics > Master [60] in Physics
Faculty or entity in charge:	PHYS