



PHY1342 Condensed Matter

[30h+10h exercises] 3 credits

This course is not taught in 2005-2006

This course is taught in the 2nd semester

Language: French

Level: First cycle

Aims

This module gives an account of the essential elements of solid state physics

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.

Other credits in programs

FSA12BA	Deuxième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(3 credits)
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