



PHY1251 Statistical physics and Thermodynamics I

[30h+22.5h exercises] 4 credits

This course is taught in the 2nd semester

Teacher(s): Pierre Defrance, Hugues Goosse
Language: French
Level: First cycle

Aims

To allow the student to acquire a good knowledge of the main ideas of thermodynamics and to be able to apply these ideas to problems or practical applications.

Main themes

Thermodynamic state of a closed system, notions of pressure and temperature.
 Macroscopic properties of perfect gases.
 Internal energy and first principle of thermodynamics ; applications to perfect gases.
 Entropy and second principle of thermodynamics, applications (including to thermal machines). Microscopic formulas of entropy (of Boltzmann).
 Thermodynamic functions and thermodynamic potential. Corresponding microscopic formulas. Equilibrium conditions.
 Real gas and phase change of pure bodies.
 Formalism of equilibrium : micro-canonic and canonic distribution.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisite : Mathematical analysis and general physics of BAC1.

Reference books:

Bertin, M., J.P. Faroux et J. Renault, Thermodynamique, Cours de physique, Classes préparatoires, 1er cycle universitaire, Dunod Université, 1982, 344 pp.

Coulon C., Le Boiteux S., Segonds P., Thermodynamique, Cours de Physique, (DEUG-Sciences) Dunod, Paris, 1997, 272 p.

Other credits in programs

PHYS12BA	Deuxième année de bachelier en sciences physiques	(4 credits)	Mandatory
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