Summary
Give the student the basic notions that will allow him or her to have a better understanding of physical phenomena, such as the mechanic of point masses. Acquire the capacity to analyse quantitatively the consequences of these effects with appropriate theoretical tools.

Content
The following subjects will be approached, in an order which will be chosen by the teacher:
- Thermodynamic systems, state variable, function of state, historical perspective …
- First principle
- Second principle
- Thermodynamic cycles
- Equation of the diffusion, transfer of heat, Fourier's law, diffusion (one dimension)
- Perfect gas, kinetic theory of gases
- Statistics: Boltzmann formula
- Maxwell-Boltzmann distribution, principle of equipartition, calculation of specific heat
- Van der Waals's gas and phase transitions

Supplementary materials (depending on the sections)
The course can also treat the following subjects:
- Supplements in mechanics (if they have not been studied in the first semester or will be in physics 2nd year), such as special relativity or lagrangian mechanics
- Thermodynamic potentials (fonctions)
- Chemical potential and chemical reactions
- Thermodynamics of out of equilibrium processes (Onsager, Eckart, Prigogine, ...), modeling of transport phenomena

Keywords
Rigid body, relativity, energy, entropy

Learning Prerequisites
Required courses
General Physics I

Learning Outcomes
By the end of the course, the student must be able to:
• Formulate a physical model
• Develop a know-how to solve a problem
• Structure models in terms of differentials equations
• Apply simplifying assumptions to describe an experience
• Estimate orders of magnitude
• Distinguish the theoretical models describing Natural phenomena
• Contextualise theoretical models in every day life

Transversal skills
• Use a work methodology appropriate to the task.

Teaching methods
Ex cathedra and exercises in class

Assessment methods
written exam

Resources
Ressources en bibliothèque
• Physics for scientists and engineers / Giancoli
• Physics / Halliday

Prerequisite for
General physics III