# Thermodynamics

ECTS

Hourly volume
43h

# Introducing

## Objectives

At the end of this module, the student should have understood and be able to explain:
- the inductive approach specific to thermodynamics which consists in generalizing, by defining them as laws, the conditions for conservation of energy and evolution of systems;
- the meaning, relevance and fields of application of the main thermodynamic functions (internal energy, enthalpy, entropy and free enthalpy).

The student should be able to:
- identify the studied system and to carry out on this system, in a current and systematic way, the mass balance, the energy balance and the entropy balance;
- use and interpret the enthalpy diagram and the entropic diagram of real fluids;
- apply thermodynamics to the understanding and description of equilibria between phases for a pure substance;
- explain the operation of thermodynamic machines (power plant, refrigeration unit, heat pump), based on the two laws of thermodynamics and on the equilibria between phases.

## Necessary prerequisites

Function of several variables and partial derivatives concepts. Integrals of usual functions. Mastery of units. General knowledge of physics and mechanics from high school.

# Practical info

## Location(s)

Toulouse