

# Thermodynamique

**Lecturer**

Nicolas CHAMEL (Coordinator)

**Course mnemonic**

PHYS-F201

**ECTS credits**

5 credits

**Language(s) of instruction**

French

**Course period**

Second term

**Campus**

Plaine

## Course content

Principles of thermodynamics, thermodynamic potentials, thermal machines, kinetic theory of gases, phase transitions, thermodynamics of dielectric and magnetic materials, thermodynamics of radiation, heat diffusion.

## Objectives (and/or specific learning outcomes)

Acquire the basics of thermodynamics in preparation for BA3 courses in statistical physics and soft matter and solid state physics.

## Pre-requisites and co-requisites

### Pre-requisites courses

MATH-F101 | Calcul différentiel et intégral I | 15 crédits, MATH-F102 | Algèbre linéaire et géométrie | 15 crédits, PHYS-F110 | Physique générale I et II | 15 crédits and PHYS-F110 | Physique générale I et II | 20 crédits

### Co-requisites courses

PHYS-F202 | Relativité, électromagnétisme et optique ondulatoire | 10 crédits

### Courses having this one as pre-requisit

PHYS-F303 | Physique statistique | 10 crédits and PHYS-F308 | Soft Matter and Solid State Physics | 5 crédits

## Teaching method and learning activities

Ex cathedra

### Contribution to the teaching profile

Build, maintain and develop knowledge in the field of physics.

- > Identify and understand the principles underlying natural phenomena (principles of conservation, symmetries, etc.).
- > Understand the laws of nature and the properties of matter through experimentation and formalization.
- > Introduce students to the mathematical, technological and experimental tools of physics.

Adopt a scientific approach to problem-solving

- > Formulate a problem into questions that can be addressed using the scientific approach.

### References, bibliography and recommended reading

The syllabus contains the entire course content. However, students wishing to deepen their knowledge may consult the following books.

Thermodynamics and an introduction to thermostatistics

H.B. Callen

John Wiley &amp; Sons (1985)

Understanding thermodynamics

H.C. Van Ness

Dover (1969)

Introduction to modern statistical mechanics

D. Chandler

Oxford University Press (1987).

### Course notes

Podcast, Syllabus and Université virtuelle

## Other information

### Place(s) of teaching

Plaine

### Contact(s)

Nicolas Chamel : nicolas.chamel@ulb.be

## Evaluation method(s)

written examination

### Evaluation method(s) (additional information)

Exam covering all course material and exercises.

## Determination of the mark (including the weighting of partial marks)

The final grade is determined by the grade obtained in the written exam.

## Main language(s) of evaluation

French

## Programmes

### Programmes proposing this course at the faculty of Sciences

BA-MATH | Bachelor in Mathematics | unit 3 and BA-PHYS | Bachelor in Physics | unit 2

