PHYS-106(en) **General physics : thermodynamics (English)**

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Cursus	Sem.	Type
Chemistry and chemical engineering	BA2	Obl.
Civil Engineering	BA2	Obl.
Electrical and Electronical Engineering	BA2	Obl.
Environmental Sciences and Engineering	BA2	Obl.
Life Sciences Engineering	BA2	Obl.
Materials Science and Engineering	BA2	Obl.
Mechanical engineering	BA2	Obl.
Microtechnics	BA2	Obl.

Language of teaching	English
Coefficient	6
Session	Summer
Semester	Spring
Exam	Written
Workload	180h
Weeks	14
Hours	**6 weekly**
Lecture	3 weekly
Exercises	3 weekly
Number of positions	**214**

Summary

Students acquire the abilities to analyze physical systems through the lens of thermodynamics, statistical physics, and special relativity.

Content

The following subjects will be covered at an introductory level:
- Thermodynamic systems, state variables, functions of state
- First law of thermodynamics
- Second law of thermodynamics
- Thermodynamic cycles
- Heat transfer, Fourier's law, diffusion (one dimension)
- Perfect gas law, kinetic theory of gases
- Statistics: Boltzmann formula
- Maxwell-Boltzmann distribution, principle of equipartition, specific heat
- Van der Waals's gas and phase transitions
- Special relativity: Lorentz transformations, relativistic energy, relativistic Doppler effect

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 simpliflying assumptions to describe an experience
- Estimate orders of magnitude
- Distinguish the theoretical models describing Natural phenomena
- Contextualise theoretical models in every day life
- Formulate physical models

Transversal skills

- Use a work methodology appropriate to the task.

Teaching methods

in-person and online lectures, in-person discussions, exercises

Assessment methods

written exam

Resources

Moodle Link

- https://go.epfl.ch/PHYS-106_en

Prerequisite for

General physics III