

UE Out-of-equilibrium Statistical physics



Level
Baccalaureate
+5



ECTS
3 credits



Component
UFR PhITEM
(physique,
ingénierie, terre,
environnement,
mécanique)



Semester
Automne

- > **Teaching language(s):** English
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** PAX9NFAD

Presentation

Description

This course is an introduction to complex interacting systems. It provides the theoretical tools for the stochastic and deterministic descriptions of the time evolution of interacting systems, and the understanding of the dynamical response of systems in microscopic terms.

Content:

- Introduction: Equilibrium and non-equilibrium statistical mechanics with some examples, general overview;
- Stochastic variables;
- Brownian motion and Langevin equation;
- The Fokker-Planck equation;
- The Master equation;
- Introduction to stochastic thermodynamics;
- Linear response theory and correlation functions;
- Non equilibrium thermodynamics and Onsager relations.

Course parts

UE Out-of-equilibrium Statistical physics - CMTD

Lectures (CM) & Teaching Unit (UE)

22,5h

Recommended prerequisites

Undergraduate course in statistical mechanics, undergraduate course in mathematical methods in physics.

Period : Semester 9

Bibliography

- Equilibrium and Non-Equilibrium Statistical Thermodynamics
Michel Le Bellac , Fabrice Mortessagne , G. George Batrouni ;
- Nonequilibrium Statistical Physics, Noëlle Pottier ;
- Lecture Notes on Non-equilibrium Statistical Physics, Bertrand Fourcade.

Useful info

Campus

- > Grenoble - University campus
- > Grenoble - Scientific Polygon