

UE Soft Matter II : statistical physics aspects; polymers



Niveau d'étude
Bac +4



ECTS
3 crédits



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



Période de
l'année
Toute l'année

- > **Langue(s) d'enseignement:** Anglais
- > **Ouvert aux étudiants en échange:** Oui
- > **Code d'export Apogée:** PAX7NFAH

Présentation

Description

Goal: To introduce the basic thermodynamics concepts to address the equilibrium and evolution properties of nano-scale systems.

Objectifs

Content: The course will start from a thermodynamic view of materials, justified by microscopic models. It will explore the rich physics and physical-chemistry that governs the formation of complex nanostructured materials, from metallic alloys to polymers and other self-organized soft matter systems. The extension to biological systems will provide examples in which these notions can be extended to non-equilibrium situations.

- Equilibrium and non-equilibrium effects in materials and nanomaterials
- Thermodynamics and phase diagrams
- Thermodynamics of heterogeneous systems and interfaces
- Heat and mass transport in condensed systems
- Dynamics of phase transitions: nucleation and growth, spinodal decomposition
- Notions on numerical models: particle based models, PDEs
- Elements of stochastic thermodynamics

Heures d'enseignement

UE Fluctuations, transport and advanced thermodynamics - CMTD	Cours magistral - Travaux dirigés	24h
UE Fluctuations, transport and advanced thermodynamics - TP	TP	4h

Période : Semestre 7

Infos pratiques

Campus

➤ Grenoble - Domaine universitaire