

UE Microscale mechanics and fluidics I : Mechanics



Niveau d'étude
Bac +4



ECTS
3 crédits



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



Période de
l'année
Automne (sept.
à dec./janv.)

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

Présentation

Description

Goal: Mechanics plays a forefront role at the nanoscale, from the generation of nano-structures by growth instabilities to the properties of nano-composite materials, the design of micro and nano-mechanical devices, the nano-imaging techniques, the control of biologic functions. This course introduces the mechanics of continuous media and its main applications to nanosciences and nano-technologies.

Objectifs

Content:

- Simple deformations, definition of elastic moduli E , G , K , ν
- Flexion of beams, static, dynamics and waves. Example: the AFM cantilever.
- 3D linear elasticity of isotropic media: strain tensor ; elasticity as a field theory (expression of the free energy) ; stress tensor ; general equilibrium equation
- elastic instabilities in thin films
- elasticity of membranes, ADN coil.

Heures d'enseignement

UE Mechanics at the micro & nanoscale - CM/TD

Cours magistral - Travaux dirigés

24h

Syllabus

Bibliography

Landau & Lifschitz "Theory of elasticity"

Période : Semestre 7

Infos pratiques

Lieu(x) ville

> Grenoble

Campus

> Grenoble - Domaine universitaire