UE Advanced Functional Nanomaterials

Niveau d'étude
Bac +5

ECTS
3 crédits

Composante
UFR Physique, Ingénierie, Terre, Environnement, Mécanique (PhITEM)

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

Diplômes intégrant cet élément

- Master Nanosciences et nanotechnologies

Langue(s) d'enseignement: Anglais

Ouvert aux étudiants en échange: Oui

Code d'export Apogée: PAX9NCAL

Présentation

Description

Goal:

To demonstrate the novelty and advances in the field of nanostructured materials and architectured coatings for dedicated functions. Their properties and applications especially in the domain of materials for energy and sustainability will be illustrated.

The different aspects of the bottom-up strategy towards nano-objects will be discussed for the fabrication of nanostructured powders and coatings. Processes using a vapor phase such as Chemical Vapor deposition and Atomic Layer Deposition will be presented in details: principles, applications, technological aspects and modelling. Special attention is focused on multimaterials stability through thermodynamics considerations.

Objectifs

Informations non contractuelles.
Dernière mise à jour le 30 juin 2026

Contents:

- Fabrication of powders, nanocrystalline ceramics and nanostructured thin films.
- Development of innovating processes : Electrostatic Spray Deposition, Spray-Pyrolysis assisted by ultrasonic atomiser, mecanosynthesis, dynamic compaction techniques, HIP and SPS sintering.
- Specific properties/structure relations (thermodynamical, electrical, catalytic, mechanical properties) of inorganic materials or nanocomposites as powders, ceramics and nanostructured membranes.
- Applications in different high technology domains : energy storage and energy conversion (fuel cells, lithium-ion batteries), environment (catalysis)

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	16h
TP	TP	8h

Pré-requis recommandés

Background in thermodynamics, materials science

Période : Semestre 9

Infos pratiques

Lieu(x) ville

Grenoble

Campus

Grenoble - Domaine universitaire

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