UE Nanomaterials and energy

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: PAX9NPAN

Présentation

Description

This course is at the crossroad between two important scientific and technological domains: energy and nanomaterials. Indeed both domains are rich in innovations, challenges and opportunities. For instance, among other sustainable green energy technologies, solar energy has been and is still developed to offer an alternative to fossil fuel energy, with efforts devoted for instance to cost reduction, efficiency improvement and use of abundant materials. We will see how nanomaterials can help improving performance of devices related to energy, and thus in very different domains (solar energy, building, energy storage…). The course will first deal with the contexts linked with energies and nanomaterials. The synthesis, characterization and main properties of nanomaterials will be presented. Applications will deal with: solar energy and nanomaterials, other energy production and nanomaterials, energy storage and finally nanomaterials and energy in buildings.

Content
This course will be presented by different scientists aiming at presenting physical and chemical aspects of nanomaterials, as well as with complementary approaches such as fundamental, experimental and applied ones. In addition to basic concepts many illustrations and challenges still persisting will be briefly presented during the whole course.

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

Chapter 1 : Energies and nanomaterials: generalities
Chapter 2 : Nanomaterials & nanotechnologies : an introduction
Chapter 3 – Solar energy and nanomaterials
Chapter 4 – Other energy conversion technologies and nanomaterials
Chapitre 5 – Energy storage
Chapitre 6 – Nano-materials and energy in buildings

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	24h

Pré-requis recommandés

General concepts in physics, solid state physics and material science

Période : Semestre 9

Infos pratiques

Lieu(x) ville

Grenoble

Campus

Grenoble - Domaine universitaire

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