

# UE Nanomaterials and energy



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:** PAX9NPAN

## Presentation

### 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.

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

## Course parts

UE Nanomaterials and energy - CMTD

Lectures (CM) & Teaching Unit (UE)

24h

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## Recommended prerequisites

General concepts in physics, solid state physics and material science

**Period :** Semester 9

## Useful info

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### Campus

› [Grenoble - University campus](#)