

UE Multiphysical couplings (THCM)



Niveau d'étude
Bac +4



ECTS
3 crédits



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



Période de
l'année
Printemps (janv.
à avril/mai)

Diplômes intégrant cet élément

- Master Génie civil

- › **Langue(s) d'enseignement:** Anglais
- › **Ouvert aux étudiants en échange:** Oui
- › **Code d'export Apogée:** PAX7MEAJ / PAX8MEAH

Présentation

Description

Multiphysics models deal with multiple simultaneous physical phenomena, which include, but are not limited to, coupling between solid and fluid mechanics, heat and mass transfer. Knowledge obtained through these models can be applied in many industrial fields and help us in the decision making process.

Objectifs

Course objectives:

This course will focus on the statement and analysis of the main multiphysical models, such as thermo/hygro/poro - elasticity, transport by diffusion and convection through porous media, transfer with phase change (sublimation condensation, solidification...).

Course program:

I: Examples

II: Single physics problems (reminder) : basics in solid, fluid mechanics and heat and mass transfer

III: Multi-physics problems

- Diffusion / conduction (Soret, Dufour, Seebeck, osmotic.... effects)
- Diffusion / convection / dispersion in porous media
- Thermo / hygro / poro elasticity — Analogy and differences

Heures d'enseignement

CMTD

Cours magistral - Travaux dirigés

20h

Pré-requis recommandés

Basics in solid mechanics, fluid mechanics, heat and mass transfer

Période : Semestre 8

Infos pratiques

Lieu(x) ville

➤ Grenoble

Campus

➤ Grenoble - Domaine universitaire