UE Cryosphère / Cryosphere

Niveau d'étude
Bac +5

ECTS
6 crédits

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

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

Diplômes intégrant cet élément

- Master Sciences de la terre et des planètes, environnement

Langue(s) d'enseignement: Anglais, Français

Ouvert aux étudiants en échange: Oui

Présentation

Description

The course will be teached in french, it can be given in english if requested

This course aims at providing a general background in glaciology focusing on qualitative (review of all forms of ice on Erath) as well as quantitative aspects (model description, various computational exercices).

A first part is dedicated to a rather comprehensive description of the various forms of ice and their environmental impacts (interactions with the climate system and more generally on the environment like sea level for instance). A focus is proposed on sea ice owing to its high sensitivity to climate warming expressing nowadays under the form of a pronounced retreat in the Arctic. A small exercice is proposed to understand and simply reproduce the formation of sea ice. Water ressources in connection with the cryosphere are also considered. Ice mechanics and their consequences on the ice flow via ice flow models are then treated with an emphasis on the archiving process in ice cores where optimal conditions, notably for datation purposes, are addressed.

A second part (equivalent in size to the first) is dedicated to snow as such. There, the detailed structure of the snow crystals is proposed along with its evolution through time as a result of local conditions leading to the so-called snow metamorphism

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

with environmental implications (radiative properties, mechanical stability..). The climate role of snow is emphasized through its radiative properties and is tackled with the help of surface energy balance models.

A third part consists of an active participation from the students during which they work on a bibliographic study under the supervision of one scientist from IGE. After choosing one or several scientific publications on selected glaciological topics, each tandem presents an oral synthesis to all other groups which serves as a basis for the continuous evaluation (contrôle continu).

Heures d'enseignement

CMTD	Cours magistral - Travaux dirigés	42h

Période : Semestre 9

Infos pratiques

Campus

Grenoble - Domaine universitaire

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