Turbulent transfers

ECTS credits
1 credits

Semester
Fall

In brief

Course langage: French

Presentation

Prerequisites

The turbulence course of the Time 1

Learning objectives

This course presents the importance of turbulence in heat and mass transfer phenomena. It deepens the knowledge compared to the Turbulence course by emphasizing the complex situations encountered in industrial applications, but also by emphasizing theoretical analysis that allows to complete and deepen the concepts presented in the first module (remembering Reynolds tensor invariants and "reliability" of models, in particular, as well as the contribution of Machine Learning to the modeling and study of turbulent flows)

Description of the programme

This module deepens the knowledge acquired in the course on turbulence by approaching the second order turbulence models and by insisting on the complex phenomena related to the couplings (pressure-velocity coupling in particular) that these models allow to take into account but also by focusing on flows with heat and/or mass transfers, topics which were not approached in the course on turbulence. This point is illustrated by analyzing concrete examples of flow encountered in industry and in the environment.

Generic central skills and knowledge targeted in the discipline

- Model and analyze turbulent flows, choosing the most appropriate model
- Master the methods of numerical modeling/simulation of turbulent flows

- Be able to calculate the main characteristics (turbulent intensities, characteristic scales) of turbulent flows
- Be able to interpret experimental results

How knowledge is tested

CC: continuous assessment, 50%.

Project: writing of a report, 50%.

Bibliography

1. Kharif, A. A. (2017b). *Instabilités hydrodynamiques et Turbulence*. CEPADUES.
2. Charru, F. (2007). *Instabilités hydrodynamiques (SAVOIRS ACTUELS) (French Edition)*. EDP SCIENCES.
3. Chassaing, P. (2000). *Turbulence en mécanique des fluides: analyse du phénomène en vue de sa modélisation à l'usage de l'ingénieur*. Cépaduès éditions.

Teaching team

Fabien Anselmet (ECM)

Malek Abid (AMU)

Sustainable Development Goal



Sustainable cities and communities



Climate action

Total des heures		**24h**
CM	Master class	16h
TD	Directed work	8h

Useful info