

Advanced heat transferts and fluid flow



Level
BAC +3



ECTS
5 credits



Component
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE



Number of
hours
65h

In brief

> **Teaching language(s):** Français, Anglais

- * additional external convection (tube batteries, impacting jets, mass transfer and evaporation)
- * internal flow convection.

Numerical simulation lab work: introduction to Ansys Fluent code and realization of a project related to the course.

Presentation

Description

Viscous Fluid Flows :

Lectures and Tutorials

- * Intro: viscosity, fluid particle, deformation, Eulerian and Lagrangian reference system
- * Fundamental eqs : Conservation of Mass, Linear Momentum (Navier-Stokes eq) and Energy, dimensional analysis and similarity
- * Internal flows: Analytical solution of the fundamental equations, friction factor, head losses, hydraulic circuits
- * External flows: laminar and turbulent boundary layers, forces on immersed bodies, elementary aerodynamics.

Heat and Mass Transfer :

Lectures and tutorials

- * unsteady conduction

Objectives

At the end of this course, the student should have understood and will be able to explain the basics allowing to approach a phenomenon involving real (viscous) fluids. He will be able to tackle situations involving more or less complex heat and mass transfers.

The student will also be able to conduct a numerical simulation with Ansys Fluent code.

Pre-requisites

Inviscid fluid dynamics (I3ICFT01 – Fluid Mechanics 1)

Introduction to heat transfer (I3ICFT01 – Heat Transfer 1)

Useful info

Place

› Toulouse