

## Real Fluid Mechanics

### Introducing

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#### 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

Labwork: Rheology, pumps characterization, hot-wire anemometry

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#### Objectives

This course is an advanced course that builds on the foundational concepts of heat transfer acquired in the Ideal Fluid Mechanics 1 (I3ICFT01) and Transferts Thermiques 1 (A3GMCM51-TT) course.

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.

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### Necessary prerequisites

It is essential to have a solid understanding of the foundational concepts taught in the

Thermodynamics

Introduction to fluid mechanics (I3ICFT01 Fluid Mechanics 1)

Transferts Thermiques 1 (A3GMCM51-TT) course.

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### Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

### Practical info

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#### Location(s)

 Toulouse