# Transfer bases

# Introducing

## Description

Transport phenomena: Continuum media, concept of shear stress. Statics of fluids. Kinematics of fluids.
Principles of conservation of mass, momentum and energy. Writing local equations and the global balances of mass, momentum and energy. Rheological laws (examples of Newtonian fluid and some non-Newtonian fluids).
Boundary conditions.
Exact solutions of some model problems. Analogies of transfers (Newton, Fourier, Fick).

## Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
- The basics of continuum mechanics
- The concept of balance and the different scales of application
The student will be able to:
- Define a system and its contours, and calculate inlet, outlet and transformation fluxes
- Write local and macroscopic balances of mass, energy and momentum
- Solve analytically simple problems of Newtonian fluid mechanics

## Necessary prerequisites

UF "Thermodynamics - Basics and Applications" from the first year of INSA or equivalent.
First-year mathematics (differential and integral calculus, notions of geometry, trigonometry and algebra).

## 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

## Location(s)

Toulouse