

## Fluid Mechanics

### Fluid Mechanics

#### IDENTIFICATION

CODE : GM-3-S2-EC-FLUID  
ECTS : 3.0

#### HOURS

Lectures : 10.0 h  
Seminars : 22.0 h  
Laboratory : 8.0 h  
Project : 0.0 h  
Teacher-student  
contact : 40.0 h  
Personal work : 40.0 h  
Total : 80.0 h

#### ASSESSMENT METHOD

#### TEACHING AIDS

#### TEACHING LANGUAGE

French

#### CONTACT

M. MIGNOT Emmanuel  
emmanuel.mignot@insa-lyon.fr

#### AIMS

"School skills in engineering :

A1- Analyze a system (real or virtual) or a problem (level 2)

A2- Use a model of a real or virtual system (level 2)

A3- Implement an experimental approach (level 2)

A4- Design a system to meet specifications (level 2)

School skills in humanity, documentation and physical and sports education :

B2- Work, learn and develop independently (level 1)

B3- Interact with others, work as part of a team (level 1)

School skills specific to the specialty :

C2- Analyze expressed or presumed needs and define the design requirements for a mechanical system to meet these needs (level 1)

C3- Design and predimension a mechanical system (level 2)

C8- Model the behavior of a system or multiphysical phenomenon (level 2)

C10- Establish a problem-solving approach (level 2)

By mobilizing the following skills :

A5- Process data

By enabling the student to work on and be assessed on the following knowledge :

- Fluid statics, wall forces, Bernoulli's theorem, momentum

- Kinematics, turbulence, continuity, fluid dynamics, pressure drop, pump.

By enabling the student to work and be assessed on the following skills:

- Apply the fundamental equation of fluid statics

- Apply the QDM theorem

- Define the kinematic properties of a flow

- Predict aerodynamic forces on an object in a flow

- Select a pump and determine the operating point of a hydraulic system"

#### CONTENT

"Calculate static and dynamic force and momentum. Use Bernoulli's

Bernoulli's theorem (perfect fluid). Write local balance equations (continuity and Navier-Stokes) and associated boundary conditions."

#### PRE-REQUISITE

Bachelor Mathematics level