

# Systèmes et Fluides Complexes



Component  
École Nationale  
Supérieure  
d'Électrotechnique  
d'Électronique

In brief

> **Ametys Code:** N7AM03A

## Presentation

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### Objectives

The objective of the module is to understand the complexity of flows due to:

- rheological properties of the fluid
- interactions with the environment

Four examples are developed:

1. Hydraulic transmission
2. Vibrations under Turbulent flows
3. Porous media
4. Complex Fluids

### Description

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Hydraulic Transmission: Study of a "Servo-Hydraulic-Actuator"

- Hydraulic Modeling and Control
- Influence of compressibility on performance
- Mechatronic simulation

Vibrations Under Turbulent Flows: Study of aeroelastic interactions (lock-in, flutter)

- Spectral and correlation analysis "real time" vibrations of a flexible structure in a turbulent flow (Welch periodogram)

- Identification of aeroelastic coupling by filtering relations (Wiener-Lee)
- Porous media

Complex Fluids