

Fluid and Thermal Mechanics

Expérimental Fluid Mechanics

IDENTIFICATION

CODE : GM-5-S2-EC-MEMFE
ECTS : 3.0

HOURS

Lectures : 0.0 h
Seminars : 20.0 h
Laboratory : 12.0 h
Project : 0.0 h
Teacher-student
contact : 32.0 h
Personal work : 10.0 h
Total : 42.0 h

ASSESSMENT METHOD

Written exam & reports

TEACHING AIDS

Course outline

TEACHING LANGUAGE

French

CONTACT

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AIMS

- Have an overview of the advanced experimental methods used in the fields of fluid mechanics and heat transfer.
- To allow R & D engineers interested in the preparation and implementation of experiments for the determination of physical quantities (such as velocity, pressure, concentration and temperature) to choose the appropriate instrumentation.
- Also master the processing of the results, their interpretation as well as the dimensional analysis.

CONTENT

Emphasis will be placed on measuring instruments specific to:

- Scalar quantities: flowrate, pressure, temperature; concentration...
- Vector quantities: velocity; turbulence, Shearing ...

Presentation of non-intrusive optical measuring techniques:

- Doppler laser anemometry,
 - Particle Imaging Velocimetry (PIV),
 - Planar Laser-induced fluorescence (PLIF),
 - Visualization by Digital Holography
- Data acquisition systems; flow visualization.
Hot Wire Anemometry.

BIBLIOGRAPHY

- Springer Handbook of Experimental Fluid Mechanics,
Cameron Tropea , Alexander Yarin , John F. Foss
- Fluid Mechanics Measurements, R. Goldstein

PRE-REQUISITE

Thermodynamics, Fluid mechanics