Two-phase hydraulics

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Code:** N9EM16B
- **Open to exchange students:** No

Presentation

Objectives

The aim of this course is to provide engineering students with the tools they need to model and calculate the hydrodynamic behavior of two-phase flows in industrial situations. These flows are extremely varied, due to the multiplicity of flow configurations that can exist (flows where one phase is dispersed in the other, where the phases are clearly separated, or where the phases flow intermittently: bubble reactors in water treatment, liquid film flows, oil transport in pipelines).

Description

- Classification of flow configurations.

- Equation of one-dimensional mass and momentum balances (averaged over the section).

- Presentation of the hierarchy of hydrodynamic coupling models between phases (two-fluid model, mixing models (drift-flow model, homogeneous model).

- Application to one-dimensional flows: - stratified flow, - bubble flow, - intermittent flow, and - annular flow.