

Two-phase flows with phase changes



Component
École Nationale
Supérieure
d'Électrotechnique
d'Électronique

In brief

- > **Amety's Code:** N9EM16A
- > **Open to exchange students:** No

Presentation

Objectives

The aim of this course is to provide future engineers with tools for modeling and sizing thermal-hydraulic installations involving liquid-vapor flows (boiling and condensation). The course focuses on formulating and solving the equations for conservation of mass, momentum and energy for two-phase flows with phase change. Modeling of heat and mass transfer terms in boiling, condensation and evaporation are presented, enabling initial sizing of two-phase heat exchangers in simple geometries.

Description

- Formulation of conservation equations integrated in a pipe section: main variables and closure laws
 - Adiabatic and mass-transfer flow configurations
 - Vase boiling regimes (Nukiyama curve)
 - Convective boiling regimes
 - Parietal and interfacial friction modeling
 - Heat and mass transfer in convective boiling
 - Heat and mass transfer in convective condensation
 - Study of parametric effects on boiling/condensation transfers (pressure, incondensables, subcooling, etc.)
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Pre-requisites

Two-phase flows" course (DIPH)

Two-phase hydraulics" course (HYDI)