Heat and Mass Exchange

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

Code ELP: N7EM05A

Presentation

Objectives

This course introduces the three main mechanisms of heat transfer (conduction, convection and radiation). The course focuses on basic methods to estimate heat flux and temperature magnitude in systems as well as industrial or natural. The program follows the book Fundamental of Heat and Mass Transfer, Bergman et al..

Description

1. Introduction : the three modes of heat transfer, energy balance, examples.
2. Heat conduction : steady-state conduction in 1 and 2 dimensions, transient conduction.
3. Convection : forced convection, external and internal flows, free convection, conservation equations, boundary layers and empirical method.
4. Radiation : radiation concept, black body, surface effects, radiation exchange between surfaces.
5. Experimental works : infrared thermography, heat conduction coefficient and thermal diffusivity measures.

Non-contractual information.
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