



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Thermal Transport down to the Nanoscale

2425-116R-M02

Title

Thermal Transport Down to the Nanoscale

Teacher(s)

Carlo Antonini

Language

English

Short description

Course description

The course aims to present heat transfer and related energy conversion phenomena, spanning from a macroscopic perspective down to the micro- and nano-scale. In the first part of the course, the fundamental classical laws (i.e. Fourier Law) will be presented, discussing their limits of validity and the size effects. In the second part of the course, engineered devices, such as heat pipes, and thermal management strategies and challenges will be presented.

Content

Part I

- Intro: Macroscopic theory of heat transfer (conduction, convection, radiation), microscopic picture, micro and nano scale transport phenomena
- Particle description of Transport Processes: classical laws
- Classical laws
- Classical size effects

Part II

- Overview of thermal management techniques
- Thermal management using heat pipes
- Thermal management in space
- Thermal transport in nanocomposites

CFU / Hours

16 hours

Teaching period

October 2025

Sustainable Development Goals

AFFORDABLE AND CLEAN ENERGY
