

IDENTIFICATION

Course code : E3B65EF2
ECTS : 2

DURATION

Lectures : 8
Tutorial classes : 24
Labs : 4
Total : 36

Project :
Personnal work :

ASSESSMENT

- In-class assignments - Homework assignments - Practical Work

TEACHING MATERIALS

- Course and TD handouts - Past exam papers - Home calculation tools

LANGUAGE

English

CONTACT

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UE : UE6.3-EFFI

COURSE : Climate Engineering

SCOPE OF THE COURSE

OBJECTIVES

To know how to size an air treatment network (production and distribution)

COMPETENCE AND SKILLS

Master the unit operations of air treatment. Master the calculation of pressure drops and the balancing of fluid networks.

PROGRAM

- Air treatment
 - Introduction/Context
 - Humid air
 - Thermodynamic properties
 - Psychrometric chart, construction and use
 - Unit operations (filtration, heating, cooling, humidification, dehumidification, mixing)
 - Load calculations (residential and industrial)
 - Air filtration and depollution
 - Conclusions, perspectives
- Distribution
 - Generalized Bernoulli equation
 - Isothermal flow, no heat exchanger
 - Presence of a heat exchanger or non-uniform temperature
 - Ideal fluid applications for flow measurement
 - Pitot tube
 - Venturi effect
 - Flow of real (Newtonian) fluids in pipes, pressure drops
 - Steady-state flow
 - Notion of pressure drop
 - Regular pressure drops
 - Non-cylindrical pipes
 - Singular pressure drops
- Network balancing
 - Case studies

BIBLIOGRAPHY

- RECNADEL-SPRENGER, *Manual of Climate Engineering*, PYC Edition, Paris, 1995
- ASHRAE Handbook : 1989 Fundamentals
- AICVF Guide, *Aeraulics : Principles of Aeraulics Applied to Climate Engineering*, PYC Edition, Paris, 1991
- IDELCHICK *Handbook of Hydraulic Resistance*

REQUIREMENTS