

## Rational use of energy



**ECTS** 5 crédits



Hourly volume

22h

# Introducing

#### Description

installations in the field of chemical engineering

- safety, energy efficiency Considering management of environmental impacts in the early step of process design and in functioning of unit processes and processes.
- \*Conception of new unit processes and processes in different industrial fields like Ecoindustry, Energy, Environment, in order to reduce the climate change threat and contribute to energy transition.

# **Objectives**

At the end of this module, the student will have understood and be able to explain (main concepts):

\*How to establish energy and exergy balances on energy production or energy consumption scenarios. Critical analysis of the obtained results.

\*Identify dysfunctions in a system and to propose optimal solutions. To propose new scenarios considering energy aspects.

\*How to establish a life cycle analysis on energy production processes and different energy use scenarios; to use a software (Umberto) and the appropriate databases. Use of results for process ecodesign.

- \* Pinch analysis for improving energy use in a process.
- \*Other optimization methods (numerical methods) depending on the case study for process ecodesign.

The student will be able to:

- \*Mobilise knowledges in chemical engineering in order to solve complex problems in the field of matter and energy processing.
- \*Conception, design, modelling, conducting and optimizing (for technical and economical criteria)

#### Necessary prerequisites

Energetic thermodynamics Process simulation and assessment Processes and energy

#### Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

# Practical info

### Location(s)



Toulouse

