INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

5th YEAR GPE_OPTION 2

Practical info

Location(s)

Toulouse

Waste treatment and valorization

ECTS
5 crédits

Hourly volume
63h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain:
- the legal and usual definitions of wastes in France.
- the strategies for waste treatment
- the principles of unit operations and processes commonly used in solid waste reduction, treatment or valorisation (chemical, biochemical or thermal processes).

The student will be able to:
- identify basic rules and policies for an environmental problem, and use it to define a technical problem or to propose an adapted solution
- quantify the dispersion of air pollutants from industrial sources
- determine the valorisation potential for an industrial waste (or gas effluent or wastewater)
- analyse and design processes the treatment or valorisation of solid wastes

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Necessary prerequisites

Good knowledge of the basis of chemical engineering

Practical info

Location(s)

Toulouse

Advanced Separation processes for new water-uses, valorisation and new resources

ECTS
5 crédits

Hourly volume
15h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
- to know the context of the new resources for water and compounds of interest (sea/brine waters, secondary effluent, food bio products)
- To know specific processes for water production (desalination, reuse, ultrapure water, water for industrial use ..)
- principle and design of sorption unit operations (ion exchange, preparative chromatography, adsorption)
- principle and design of advanced membrane separation operations (reverse osmosis, electromembrane processes)
- principle and design of unit operations based on a phase transition (precipitation, crystallization,¿)

The student will be able to:
- to design processes for domestic wastewaters tertiary reuse
- to design desalination processes
- to design design processes for ultrapure water production or specific water for utilities
-to design processes for N , P and C recovery
- identify new resources
- conceive and design systems for these new resource use
- apply the knowledge to other case studies

Necessary prerequisites

Unit operation I4PETF31
Chemistry I1ANBC11
Energy and mass balance I3BEGP11
2AICBE Numerical Methods of resolution

Practical info

Location(s)

Toulouse