

Separation processes for specific quality water production and new resource exploitation

 **ECTS**
5 credits

 **Component**
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE

 **Number of hours**
51h

Presentation

Description

Programme (detailed contents):

1 New resources for human, agricultural or industrial use

Sea water /brine Waters

Secondary effluents

Nitrogen, Phosphorus

(bio) products from wastewaters

2 Processes for specific quality water production

Reuse

Desalination

Water for process (conditioning)

1. Recycling (water in the process)

1. Design of unit operations

- ion exchange, chromatography, adsorption/desorption

- Reverse osmosis, electro dialysis

- decarbonation, precipitation, crystallization

Organisation:

L/T/Lab work/project

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
- identify new resources
- conceive and design systems for these new resource use
- apply the knowledge to other case studies

Pre-requisites

Basic concepts for unit operations

Technology and design of unit operations

Heat transfer and reactors

Basis of chemistry

Useful info

Place

➤ Toulouse