Engineering of drinking water production and water treatment

Component
INSTITUT NATIONAL DES SCIENCES APPLIQUEES TOULOUSE

Number of hours
86h

In brief

Teaching language(s): Français, Anglais

Presentation

Description

Programme (detailed contents):

- fresh water resources, availability, quality and uses

- pollutions due to the conventional waste water treatment line

- regulations on potable water (national and international level) and on waste waters

- the drinking water production lines, role of unit operations and history of these lines – design of coagulation, settling, ultrafiltration, removal of iron and manganese, ozonation and chlorination steps

- the waste water treatment lines – design of an activated sludge system – sludge methanisation (digestion, treatment and valorisation of biogas) – sludge treatment : wetting and wet air oxidation)

Organisation:

Lecture-conferences, a project, tutored problems based on complex and real examples and lab-work (on a biological system for waste water treatment and on a membrane process). The project focuses on the design of a WW treatment plant in the framework of a real situation renewed each year.

Objectives

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

- the notions of resources and uses of water, of pollutions of receiving waters

- the european and french regulations on potable water and on waster water treatment

- the main treatment lines for drinking water production and for waste water treatment and the function of unit operations in these lines

- the more recent technologies that are mainly used in these lines and the principle of their operation

The student will be able to:

- elaborate a document concerning the treatment plant definition and construction

- propose a drinking water production line (from fresh waters) and designing the main operations in this line as well as the energetic consumption

- compare different processes for waste water and sludge treatment

- design a wastewater treatment plant for the removal of major pollutants and choosing a technology for sludge treatment

- design a sludge digestion system

Pre-requisites

Hydraulics and dispersed systems

Heat transfers and real reactors

Thermodynamic properties of real fluids and mass transfer

Basic concepts for unit operations

Unit operations : technology and design

Basis on chemistry and biochemistry

Useful info

Place

Toulouse