

Module Description

Wastewater treatment (WWT) - Theory and bases for design

General Information

Number of ECTS Credits

3

Abbreviation

TSM_WWTreat

Version

10.10.2015

Responsible of module

Ing Paolo Foa, SUPSI

Language

	Lausanne	Bern	Zürich	Lugano
Instruction	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E	<input type="checkbox"/> D <input checked="" type="checkbox"/> E
Documentation	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E	<input type="checkbox"/> D <input checked="" type="checkbox"/> E
Examination	<input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E	<input type="checkbox"/> D <input checked="" type="checkbox"/> E

Module category

- Fundamental theoretical principles
 Technical/scientific specialization module
 Context module

Lessons

- 2 lecture periods and 1 tutorial period per week

Brief course description of module objectives and content

The course will focus on the design of the main waste water treatment steps, giving principle, key factors and all the numerical information for the relevant calculations.

In order to link the notions given during the classes to the reality, at least two visit to local WWTPs are organized: during each of those the students will deal with the aspects they are going to see "on the paper".

An overview on the evolution / innovation closes the course.

A brief introduction to chemical, physical and biological elementary concepts as well as a general overview of what is a WWTP is foreseen; however theoretical basics in wastewater field are a requirement to take the maximum advantage from the course.

Aims, content, methods

Learning objectives and acquired competencies

The course aims at providing students with the following skills:

- refresh of chemical, physical and biological elementary concepts
- fundamentals for designing the main unit operations of a WWTP
- face to the reality of existing local WWTPs

Contents of module with emphasis on teaching content

- Introduction: chemical, physical and biological elementary concepts
- Overview of a WWTP
- Part 1: pre-treatment
 - o Plant visit
 - o Input data & pumping section
 - o Grit & oil removal
 - o Primary sedimentation
- Part 2: biological step
 - o Plant visit
 - o Biology 1
 - o Biology 2
 - o Secondary clarification
- Part 3: innovation
 - o Micropollutants
 - o WWTP & energy

Teaching and learning methods

Front lecturing (theory) with open discussion and classworks with calculation exercises

Prerequisites, previous knowledge, entrance competencies

Wastewater process, chemistry

Literature

- Slides given at the course from the Lecturer;
- Tchobanoglous et al. (2003) Wastewater Engineering Treatment and Reuse, Metcalf & Eddy, McGraw Hill, 4th Edition.

Assessment**Certification requirements for final examinations (conditions for attestation)****Written module examination**

Duration of exam : 120 minutes

Permissible aids: - Calculator, personal notes