ENV-509

Applied wastewater engineering

Mattle Michael Jon

Cursus	Sem.	Type
Energy Management and Sustainability	MA1, MA3	Opt.
Environmental Sciences and Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	During the semester
Workload	90h
Weeks	14
Hours	**2 weekly**
Courses	1 weekly
Exercises	1 weekly
Number of positions	

Remark

pas donné en 2018-19

Summary

This course on applied wastewater treatment focuses on engineering and scientific aspects to achieve high effluent water quality and to handle wastes and air emissions generated in wastewater treatment plants.

Content

Organic micropollutant removal (major topic of course)
Biological treatment, ozonation, activated carbon, combined and other processes, sand filtration, existing and planned installations in Switzerland

Treatment of wastewater solids (major topic of course)
Sludge characterisation, thickening/stabilisation/dewatering and drying of sludge, energy and nutrient recovery, incineration and land application

Air emission control
Types of emissions, chemical and biological treatment methods, reduction of greenhouse gases

Disinfection of wastewater
Biological treatment, sedimentation, UV-disinfection, disinfection using oxidants, filtration techniques

Reuse of wastewater
Effluent requirements (agriculture, groundwater recharge, potable reuse), sociological aspects

Keywords

organic micropollutants removal, sludge treatment, air emission control, nutrient and energy recovery, disinfection of wastewater, reuse of wastewater, engineering

Learning Prerequisites

Required courses

• Water and wastewater treatment (can be taken during the same semester)

Recommended courses

- Génie des procédés
- Génie sanitaire, gestion des eaux et des déchets

Learning Outcomes

By the end of the course, the student must be able to:

- Design an organic micropollutant removal process
- Propose an adequate sludge treatment
- Plan an exhaust air treatment sub-unit
- Assess / Evaluate the water quality needs for a water reuse project

Teaching methods

Lectures ex cathedra, exercises and one or two visits to a wastewater treatment plant

Expected student activities

Participation in homework sessions and in wastewater treatment plant visits

Assessment methods

One written mid-term exam during the semester (20%) and one final exam (80%)

Resources

Bibliography

Provided via moodle

Notes/Handbook

Provided weekly via moodle

Websites

- http://moodle.epfl.ch/