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, elimination of sludge

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

Keywords
organic micropollutants removal, sludge treatment, air emission control, nutrient and energy recovery, 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
• Analyze the interactions between the different processes of a wastewater treatment plant
• Plan an exhaust air treatment sub-unit
• Sketch all processes of an entire wastewater treatment plant

Transversal skills
• Give feedback (critique) in an appropriate fashion.
• Make an oral presentation.
• Assess one’s own level of skill acquisition, and plan their on-going learning goals.
• Continue to work through difficulties or initial failure to find optimal solutions.

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

Expected student activities
Participation in homework sessions (group work) 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/