ENV-509

# Applied wastewater engineering

Mattle Michael Jon

| Cursus | Sem. | Type |
|---|---|---|
| Environmental Sciences and Engineering | MA1, MA3 | Opt. |

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

## Remark

Donné une année sur deux, les années impaires

## 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

- Traitement et valorisation 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 (30%) and one final exam (70%)

## Resources

### Bibliography

Provided via moodle

### Notes/Handbook

Provided weekly via moodle

### Websites

- http://moodle.epfl.ch/

### Moodle Link

- https://go.epfl.ch/ENV-509