

	Lectures and exercises in ZOOM			Laboratory work			
Lecture 3,5 h each, mixture with interactive lecture and exercises	Lecture Topic	Lecturer	Exercise	Common lab work	Group lab work	Lab work instructors	DEADLINES
1 2.3.2021 13-16.30	Course introduction	Anna Mikola	Introduction to lab-scale reactor and lab project				
2 4.3.2021 8:30-12	Introduction to microbiology Classification of microbes Identification DEMO: DNA sequencing	Antonina Kruglova	HW 1 Bioinformatic assignment				DL for the self-learning material and quiz on microbiology Group 1: Select your lab timetable
9.3.Tuesday 12.30 – 14.00	Water lab safety training (15 min) when arriving in the lab (only for new- comers, see the separate lab schedule)	Aino Peltola					

3 9.3.2021 13-16.30			Lab study material: Basic monitoring of the reactors: Influent fractions Nutrients Sludge analyses HW 1 Microbiology exercises + reporting of microscopy	LABORATORY WORK Lab reactors Microscoping (1&2) Plating		Maria, Oona, Antonina, Aino, Marina,	
9.3.2021 Part of the lab work				Introduction for pilot operation Group 1	Group 1: Pilot operation and monitoring DO	Maria	
4 11.3.2021 8.30 -12			HW 1 Microbiology exercises + reporting of microscopy	LABORATORY WORK Plating results Microscoping (3&4)		Maria, Antonina, Aino, Oona	Group 2: Select your lab timetable
16.3.2021 13 - 14			1 st small exam on microbiology				Exam 1
5 16.3.2020 14-17	Biodegradability COD fractions toxicity/inhibition Introduction to biological processes	Anna Mikola	HW 2 Biodegradability, organic matter fractions			Maria	DL Basic monitoring quiz

tbd				Introduction for pilot operation Group 2			
6 18.3.2021 8.30-12	Activated sludge process Aerobic and anoxic processes, Nitrogen removal Sludge age Process design of biological processes (simple approach)	Anna Mikola	HW 3 Nitrogen removal exercises, sludge age Nitrification design Process design and dimensioning AS/N		Group 2: Pilot operation and monitoring Anoxic phase	Maria,	Group 3: Select your lab timetable
7 23.3.2021 13-16:30	Biofilm processes MBR, AGS MFC, bioaugmentation algae and fungi	Anna Mikola Danielle Bansfield	HW 4 SUMO exercises for N and bioP Biofilm design			Maria	DL HW 1
tbd				Introduction for pilot operation Group 3	Group 3: Pilot operation and monitoring BioP	Maria,	
8 25.3.2021 8.30 -12	Storage processes Phosphorus removal Anaerobic processes Cell functions and growth reaction,	Anna Mikola		Preparation for group presentations		Maria	DL HW 2 Group 4: Select your lab timetable

	stoichiometry and kinetics, Monod Process design of biological processes (advanced approach)						
30.3.2021 13-14			2 nd small exam on COD fractions, biological processes, biofilms and N removal etc				Exam 2
9 30.3.2021 14-17	Anaerobic digestion Sulphur reactions and corrosion Introduction Viikinmäki WWTP	Marika Kokko Maria Valtari	HW 5 stoichiometry reaction kinetic Monod Digester design removal/digester/ composting			Maria	DL HW 3
tbd				Introduction for pilot operation Group 4	Group 4: Pilot operation and monitoring Temperature	Maria	
10 1.4.2021 8.30 -12	Excursion to wastewater treatment plant	Viikinmäki Anna Kuokkanen	Exercises to be completed at the plant			Maria	
11 6.4.2021 13-16.30	Sludge treatment Composting	Federico Varalta	Support session the lab project			Maria	DL HW4

	Drinking water treatment Air&soil treatment Removal of micropollutants and antibiotic resistance	Anna Mikola Antonina Kruglova					
12 8.4.2021 8.30 -12	Summary Course feedback discussion	Anna Mikola	WWTPcatching results Support session for the lab project 3 rd small exam, bioP, anaerobic processes, advanced process design etc.	End of pilot reactor operation		Maria	First draft for the lab project report Exam 3
13.4.2021 13 – 16			Laboratory project seminar				DL HW 5
15.4.2021							Submission of lab project outputs