

	Lectures and exercises in 286/287			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
25.2. or 26.2. Tuesday 9-11	Lab security training and test for new-comers	Aino Peltola					
1 26.2.2019 13-16.30	Course introduction	Anna Mikola	Introduction to lab-scale reactor and lab project				
2 28.2.2019 8:30-12	Biodegradability COD fractions toxicity/inhibition Introduction to biological processes, reaction stoichiometry and kinetics, Monod	Anna Mikola	HW 1 Biodegradability, stoichiometry reaction kinetic Monod				Group 1: Select your lab timetable

3 5.3.2019 13-16.30				LABORATORY WORK Basic monitoring of the reactors: Influent fractions Nutrients Process operation Sludge quality		Aino, Antonina, Marina, Anna, Maija, Heikki	
6.3.2019				<b>Introduction for pilot operation Group 1</b>	Group 1: Pilot operation and monitoring DO	Maija, Antonina	
4 7.3.2019 8.30 -12	Activated sludge process Sludge age Aerobic and anoxic processes, Nitrogen removal  Biofilm processes	Anna Mikola	HW 2 SUMO exercise Nitrogen removal exercises, sludge age Organic matter fractions Nitrification design Process design and dimensioning AS/N				Group 2: Select your lab timetable DL Monitoring toolbox
5 12.3.2019 13-16.30	Introduction to microbiology Classification of microbes Identification	Antonina Kruglova		LABORATORY WORK Plating			Antonina

13.3.2019				<b>Introduction for pilot operation Group 2</b>	Group 2: Pilot operation and monitoring Anoxic phase	Maija, Antonina	
6 14.3.2019 8.30-12	Storage processes Phosphorus removal	Antonina Kruglova Anna Mikola	Microbiology assignment	LABORATORY WORK Plating		Antonina Aino Marina, Anna, Maija	Group 3: Select your lab timetable
14.3.2019 16.30 -17.30			1 <sup>st</sup> small exam on biological processes and NP removal				<b>Exam 1</b>
7 19.3.2019 13-16.30			HW 3 Microbiology exercises + reporting of microscopy	Microbiology lab DNA sequencing Microscopy Uptake rates		Antonina Aino	DL HW 2
20.3.2019				<b>Introduction for pilot operation Group 3</b>	Group 3: Pilot operation and monitoring BioP	Maija, Antonina	
8 21.3.2019 8.30 -12	Cell functions and growth Anaerobic processes Anaerobic digestion	Antonina Kruglova Guest lecturer Marika Kokko		Preparation for group presentations		Antonina Aino	Group 4: Select your lab timetable

21.3.2019 16.30 -17.30			2 <sup>nd</sup> small exam on microbiology				<b>Exam 2</b>
25.3.2019 13 - 15	Special lecture on aquaculture	Jouni Vielma LUKE					
9 26.3.2019. 13-16.30	Process design of biological processes  Sludge treatment Composting	Anna Mikola  Federico Varalta	HW 4&5 SUMO exercise for N and bioP Biofilm design Digester design removal/digester/composting Introduction Viikinmäki WWTP			Antonina Maija Aino	
27.3.2019				<b>Introduction for pilot operation Group 4</b>	Group 4: Pilot operation and monitoring Temperature	Maija, Antonina	
10 28.3.2019 8.30 -12	Excursion to water treatment plant	Viikinmäki Anna Kuokkanen	Exercises to be completed at the plant				
11 2.4.2019 13-16.30	<b>Miniconference on emerging biological treatment applications</b> Drinking water treatment Special processes: MBR, algae, MFC, AGS Air&soil treatment	Anna Mikola Antonina/Irina/Juan Students  other guests	Support session the lab project				Antonina

12 4.4.2019 8.30 -12	Summary Course feedback discussion	Anna Mikola	WWTPcatching results Support session for the lab project 3 <sup>rd</sup> small exam anaerobic processes, process design and applications	<b>End of pilot reactor operation</b>			First draft for the lab project report <b>Exam 3</b>
9.4. 13 - 16			Laboratory project seminar				DL HW 4&5
11.4.							Submission of lab project outputs