Start	End	**Wednesday 17 May 2017** Theme: Fundamentals of activated sludge and biofilm operations	Lecturer	Duration [houres]
8:00	9:00	Registration		1:00
9:00	9:10	Welcome: outline of the course	Giorgio Mannina	0:10
9:10	10:00	Behaviour different organic types in the activated sludge systems and principles of biological processes (the Gujer matrix)	George Ekama	0:50
10:00	11:00	Principles of removal of C, N and P compounds in biofilm systems	Hallvard Ødegaard	1:00
11:00	11:30	Coffe break		0:30
11:30	12:30	Principles and fundamentals of the ASM aligned steady-state model for sizing activated sludge systems performing organic matter removal	George Ekama	1:00
12:30	13:30	Nitrification, denitrification, nitritation and anammox process in the moving bed biofilm reactor (MBBR)	Hallvard Ødegaard	1:00
13:30	14:30	Lunch		1:00
14:30	15:30	Principles and fundamentals of the steady-state model for activated sludge systems performing organic matter and Nitrogen removal	George Ekama	1:00
15:30	16:30	Fundamentals of dynamical modelling for wastewater treatment	Gustaf Olsson	1:00
16:30	17:00	Small coffe break		0:30
17:00	18:00	Sizing Organic matter and nitrogen removal activated sludge systems	George Ekama	1:00
18:00	19:00	Control Principles	Gustaf Olsson	1:00
19:00	19:00	End of session		
		Thursday 18 May 2017 Theme: Hybrid, MBR and BF-MBR systems. Mathematical models		
9:00	10:00	Hybrid systems (IFAS)	Hallvard Ødegaard	1:00
10:00	11:00	Sedimentation: primary and secondary	Peter Vanrolleghem	1:00
11:00	11:30	Coffe break		0:30
11:30	12:30	Dynamic models ASM-like for wastewater	Peter Vanrolleghem	1:00
12:30	13:30	Principles of enhanced biological phosphorus (EBPR) removal	George Ekama	1:00
13:30	14:30	Lunch		1:00
14:30	15:30	Instrumentation, control and automation (ICA) applications in wastewater treatment systems	Gustaf Olsson	1:00
15:30	16:30	Greenhouse gases modelling: principles and knowledge gaps	Peter Vanrolleghem	1:00
16:30	17:00	Small coffe break		0:30
17:00	18:00	Denitrification in EBPR systems and sizing ND EBPR systems	George Ekama	1:00
18:00	18:00	End of session		
		Friday 19 May 2017 Theme:Mathematical modelling, sensitivity analysis, calibration and uncertainty		
9:30	10:30	Impact of membranes on ND EBPR systems	George Ekama	1:00
10:30	11:30	Biomass separation in biofilm (MBBR) systems	Hallvard Ødegaard	1:00
11:30	12:00	Coffe break		0:30
12:00	13:00	Models for design of WWTPs and uncertainty	Peter Vanrolleghem	1:00
13:00	14:00	Whole plant modelling and resource recovery	Peter Vanrolleghem	1:00
14:00	15:00	Lunch		1:00
15:00	16:00	ICA applications in wastewater treatment systems	Gustaf Olsson	1:00
16:00	17:00	Instruments and actuators for online control. Data screening	Gustaf Olsson	1:00
17:00	17:30	Small coffe break		0:30

17:30	**18:30**	Pro's and con's of MBR systems	Hallvard Ødegaard	1:00
18:30	**18:30**	End of session		
		Saturday 20 May 2017		
		Theme: WWTP modelling and future perspectives		
9:00	**10:00**	A road-map for designing energy-neutral wastewater treatment plants for the future	Hallvard Ødegaard	1:00
10:00	**11:00**	Signal analysis and monitoring	Gustaf Olsson	1:00
11:00	**11:30**	Coffe break		0:30
11:30	**12:30**	Recent developments in biological nutrient removal	George Ekama	1:00
12:30	**13:30**	Energy for water supply and wastewater treatment	Gustaf Olsson	1:00
13:30	**14:30**	Lunch		1:00
14:30	**15:30**	Identifiability analysis and experimental design	Peter Vanrolleghem	1:00
15:30	**16:30**	Calibration and sensitivity analysis	Giorgio Mannina	1:00
16:30	**17:00**	Small coffe break		0:30
17:00	**18:00**	Sensitivity analysis: examples of model application ASM based	Giorgio Mannina	1:00
18:00	**18:00**	End of session		