Nutrient Removal in Wastewater: Recovery and Reuse

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Overview

Most of the existing sewage treatment plants are able to remove organic matter at high rate; however, they are not suitable to treat the increasing concentration of nutrients, mainly nitrogen and phosphorus. Discharge of partial municipal wastewater with high concentrations of nutrient can cause severe environmental damage – eutrophication of surface waters. Major modifications on sewage treatment plants are necessary to achieve the required level of nutrients to reduce environmental negative impact. The course aims to take a step forward to unravel the basics and newly technologies for domestic wastewater treatment.

This course is organized to provide the basis of the microbiology and mathematical description of organic matter and nutrient removal from domestic wastewater and an ad-hoc design of different aerobic processes, such as activated sludge systems, sequential batch reactor, rotating bathing reactor and algal-bacterial processes. The topics will cover the fundamentals of microbial carbon and nutrient removal in both aerobic and anaerobic processes; guidelines for the design and operation of several systems and; guidelines of operation and maintenance of sewage treatment processes for odor pollution control and biogas upgrading.

Course participants will learn these topics through lectures and short assignments. Also two short tests in the middle of the course will be applied to stimulate research motivation of participants.

Dates	**July 2nd - July 6th** **Number of participants for the course will be limited to 30** **Schedule of Lectures:** **July 2, 2018** 10.00 AM – Inauguration of Programme 10.30 AM – Tea break 11.00 AM - 12.00 Noon – Introduction; Microbiology of Carbon and Nutrient removal 12.00 Noon – 1.00 PM – Activated Sludge fundamentals 1.00 PM – 1.30 PM – LUNCH BREAK 1.30 PM – 2.30 PM – Design of modified activated sludge processes 2.30 PM – 3.30 PM - Tutorial: Practical design of activated sludge 3.30 PM – 3.45 PM – tea break **July 3, 2018** 9.30 AM – 10.30 AM – Activated sludge system for Carbon removal 10.30 AM – 11.30 AM – Activated sludge for nutrient removal 11.30 AM – 11.45 AM – Tea break 11.45 AM - 12.45 PM – Tutorial: Practical design of activated sludge for nutrient removal 12.45 AM – 01.45 PM – Exam 1 01.45 PM – 02.15 PM – Lunch break 02. 15 PM –03.15PM - Tutorial: Practical design of activated sludge for nutrient removal

	July 4, 2018 9.30 AM – 10.30 AM – IWA modelling (ASM1) 10.30 AM – 11.30 AM – Influence of design and operational conditions 11.30 AM – 11.45 AM – TEA BREAK 11.45 AM - 12.45 PM – Tutorial: Software use 12.45 PM – 01.45 PM – Assignment and tutorials 01.45 PM – 02.15 PM LUNCH BREAK **July 5, 2018** 9.30 AM – 10.30 AM – Solid- liquid separation theory 10.30 AM – 11.30 AM – Solid- Liquid separation technologies 11.30 – 11.45 AM – TEA BREAK 11.45- 12.45 – Tutorial: Secondary settler design 12.45 PM – 1.15 PM LUNCH BREAK 1.15 PM – 2.15 PM – Tutorial: Secondary settler design 2.15 PM – 3.15 PM - SHORT TEST – EXAM **July 6, 2018** 9.30 AM – 10.30 AM – Odor pollution Control 10.30 AM – 11.30 AM – Odor pollution Control 11.30 AM – 11.45 AM – TEA BREAK 11.45 AM- 12.45 PM – Tutorial: Design of odor treatment 12.45 PM – 1.15 PM LUNCH BREAK 1.15 PM- 2.15 PM – Tutorial: Design of odor treatment 2.15 PM – 03.15 – Exam 1 03.15 PM – 03.45 PM - Valedictory function 03.45 PM – TEA BREAK
You Should Attend if…	▪ you are a junior engineer, assistant engineer and executive engineer from public health department/ central/ state pollution control boards ▪ you are sanitary, environmental and civil engineer or designer engineer in private/ public sector ▪ you are biochemist, biotechnologist and chemist ▪ you are researcher in the environmental field working on water and wastewater treatment ▪ you are a student of all level (B.Tech, M.Tech and Ph.D.)
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $500** **Industry/ Research Organizations: Rs. 12,500** **Academic Institutions: 5,500** **Students: 2,000** The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis. **Registration fee: 500**

The Faculty

Dr. Beni Lew is a senior researcher in the Volcani Center in Israel. His research interests include systems and *technologies for water and wastewater treatment* – physical, chemical and biological processes.

Dr. Abid Ali Khan is an Assistant Professor of Jamia Millia Islamia, New Delhi. His research interest is Post treatment of Anaerobic Effluent, Enhanced Anaerobic Digestion and Nutrient Removal from Wastewater.