

High-Rate Bioreactors for the Treatment of Industrial Wastewater

Overview

Water is a valuable and ever more estimated natural resource. For pulp and paper industry, it is one of the essential requirements for production and is needed in tremendous amounts relative to the amount of products. In densely populated highly industrialized regions like Central Europe, the industry soon learned to decrease the specific amount of water needed for production since the amount of products had increased. Most of the water needed for production ends up as wastewater (only a small quantity is evaporated). Wastewater treatment in the pulp and paper industry needs special treatment to meet legal requirements. The advanced methods of wastewater treatment have ensured that the paper industry today is an environmentally friendly industry with rather low emissions usually having no relevant toxicity. The water used for the production of paper, carton and cardboard always extracts soluble substances contained in the fibres. Chemical additives (mostly soluble in water) are used which must be removed in the following treatment steps. The European pulp and paper industry has invested substantially in environmental improvements. The result has been the decoupling of environmental impacts from production growth. While production and some physical parameters (primary energy consumption, electricity consumption, water consumption) have increased since 1990 (production by 150%, for example) the environmental impact measured in emissions (CO₂, BOD, COD, AOX, SO₂ and NO_x) has decreased.

The course will show state-of-the-art technology of high-rate bioreactors in the treatment of industrial effluent exemplified on paper industry. Moreover, the effluent is becoming a new resource for the so called "green-chemistry" in anaerobic high-rate-reactors and might give some incentives to other industries as well.

Objectives:

The primary objectives of the course are as follows:

- Presenting participants the fundamentals of water use in paper industry
- Introduction to typical wastewater treatment processes in industry
- Fundamentals and design-criteria for high-rate aerobic bioreactors
- Application and design of high-rate anaerobic treatment processes to generate CH₄ as well as other valuable chemicals

The Faculty



Prof. A. Schmid is Full-Professor for water and wastewater treatment at the University of Applied Sciences, Hof. Working experiences for more than 15 years in water industry, especially in the treatment of domestic wastewater, wastewater from pulp and paper industry, oil refineries and food industry enables him to present profound knowledge in the mentioned lecture series. He is author of several articles in the field of advanced wastewater treatment and holds some issued and pending national and international patents.

Scientific Awards: Fritz-Leonhard-Reuther Award, J.F. Richardson Award, Invitation at the 50. annual international meeting of the Nobel laureates at Lindau – Germany, Appreciation by the DECHEMA - Willy-Hager-Stiftung, Appreciation by the ATV-DVWK - Karl-Imhoff-Award 2002, Member of Science Advisory Board of 6th Annual World Congress of Industrial Biotechnology, 2013, Nanjing, China, Honorable Guest and Chairman of Keynote Lectures at 2nd International

Conference on Hydrology & Groundwater Expo, 2013, Raleigh, USA

Participation in Scientific Working Groups: National delegate of Working Group no. 4 Biological Processes of COST-Action 624 "Optimal Management of Waste-water Systems" European cooperation of scientific and technical research (COST); Scientific adviser for IWA (International Water Association) Expert in Wastewater Treatment - Emphasis in Activated Sludge Population Dynamics and Advanced Technologies; Member of Special Committee for the Appointment of Academic Staff at the Technical University Cyprus; Reviewer for the Journal Water Science and Technology, for the Journal IWA Open Water Journal, for the Journal Chemosphere, for the Journal Industrial Biotechnology. Member of DWA - German Water Association, DWA-specialist working group IG-5.1 "Anaerobic treatment of industrial wastewater"; Guest DWA-main working group IG "Industrial wastewater treatment"; Member of IWA - International Water Association, EFB - European Federation of Biotechnology,

Deputy Leader of VDMA-Specialist Group "Sludge Disintegration", Member of FUTUR-workgroup of BMBF - German Ministry of Education and Science.



Dr. Hema is an Associate Professor in the Department of Biotechnology, PSG College of Technology, Coimbatore, Tamil Nadu. She has more than 12 years of teaching and research experience. Her field of research is Environmental Biotechnology. Her team is working on utilizing plant microbe interactions in developing sustainable methods for industrial wastewater treatment. She has also worked for novel defluoridation plants. She has worked on urban solid waste management and development of strategies for managing organic waste in densely populated areas. Her current work involves use of sequential anaerobic - aerobic treatment of textile industry wastewater using plant – microbe integrated system for effectively removing the harmful by-products generated during treatment. She is also involved in societal projects for the upliftment of rural women.

Course	September 3rd to September 9th 2018 Number of participants for the course will be limited to fifty (on first come, first serve basis).
Host Institute	PSG College of Technology, Peelamedu, Coimbatore, Tamilnadu-641004
You Should Attend If...	you are an <ul style="list-style-type: none"> - Executive, engineer or researcher from manufacturing, service and government organizations including R&D laboratories. - Student at all levels (BTech/B.E/M.Sc/M.Tech/PhD) or Faculty from reputed academic institutions and technical institutions.
Fees	The participation fees for the course is as follows: The participation fees (excluding lodging and boarding) for taking this course is as follows: Students: Rs. 1,000/- (without grading) and Rs. 2,000 (with grading) Faculty members from academic institutions: Rs.3000/- Persons working in Industry/ Research Organizations: Rs. 4,000/- The above fee includes all instructional materials, computer use for tutorials and assignments, and session refreshments. Limited number of participants can be provided with accommodation (first come, first serve) on payment basis.
How to Register?	Step-1: Web Portal Registration: Visit http://www.gian.iitkgp.ac.in/GREGN/index and create login User ID and Password. Fill up registration details and complete the registration by paying Rs. 500/- online through Net Banking / Debit / Credit card. This provides the user with life time registration to enroll in any number of GIAN courses offered. Step-2: Course Registration: Login to the GIAN portal with the user ID and Password already created in Step 1. Click on Course Registration option at the top of Registration Form. Select the Course titled " High-Rate Bioreactors for the Treatment of Industrial Wastewater " from the list and click on Save option. Confirm your registration by clicking on Confirm Course. The selected participants will be intimated by us through email, regarding the payment modality for this course.
Course Coordinator	Dr. J. Hema Associate Professor, Department of Biotechnology PSG College of Technology, Peelamedu, Coimbatore, Tamilnadu-641004 Phone: 0422-2572177 Extn:4583 E-mail: jhema@bio.psgtech.ac.in