Membrane Bioreactors for Sustainable Wastewater Treatment and Bioenergy Production

.....

Overview

With ever-increasing consumption and pollution of our limited water resources, water scarcity has brought rising levels of public concern on a global scale. However, this worsening situation could be alleviated through sustainable water reuse schemes which include using appropriate wastewater treatment technologies to treat and reclaim wastewater. Starting from the last century, anaerobic wastewater treatment technology has been recognized as a more promising alternative to conventional aerobic bioprocesses due to its prime advantages in low energy consumption, net energy production (methane generation) and sludge minimization. However, to solve the problems associated with poor retention of anaerobic microbes in conventional anaerobic treatment processes, anaerobic membrane bioreactors (AnMBRs) have been considered as an attractive approach.This course aims to provide a holistic approach to explore the different configurations of anaerobic bioreactors and more in-depth about AnMBRs through three stages: (i) introduction of fundamental concepts for boosting the understanding of technological basis and challenges of AnMBRs, (ii) introduction of AnMBR's for sustainable performance in terms of pollutants removal and biogas production and (iii) case-studies and discussion about the performance of AnMBRs.

The main rationale of this course is to develop the know-how on scientific and technological principles of AnMBRs as a sustainable technology for wastewater treatment via a systematic approach.Thiscourse will enable students to gain further understanding of principles of different anaerobic bioreactors and AnMBR technology, such as concept, process design, process performance and applications. The expected learning outcome of the course are as follows:

- Studentswill be able to design the AnMBRs
- Synthesize new ideas for eliminating water pollution, water scarcity and energy scarcity by developing alternative treatment systems
- Students will learn problem solving skills in the design and operation of AnMBRs

Dates for the Course	**14th November 2018 to 20th November 2018**
Host Institute	**IIT Madras**
No. of Credits	**1**
Maximum No. of Participants	**30**
You Should Attend If…	▪ You work in the area of wastewater treatment using biological processes ▪ You are a student or faculty from academic institution interested in learning theconcepts of bioenergy production from wastewater and also about membrane bioreactors
Course Registration Fees	The participation fees for taking the course is as follows: **Student Participants:** Rs.1,000 **Faculty Participants:** Rs.2,500 **Government Research Organization Participants**: Rs.5,000 **Industry Participants:** Rs.10,000 The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, laboratory equipment usage charges, refreshments between sessions and working lunch. Accommodation is not a part of registration fee. **Mode of payment:** **Online transfer: (Preferred)** Account Name: CCE IIT Madras Acc. No.: 36401111110 Branch: SBI, IIT Madras Branch, Chennai , IFSC Code: SBIN0001055 **OR** Demand draft in favor of "Registrar, IIT Madras" payable at Chennai. **The demand draft is to be sent to the Course Coordinator at the address given below.**
Accommodation	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Accommodation is not a part of registration fee. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel

Course Faculty

Dr Huu Hao Ngo is currently a Professor of Environmental Engineering and serving as Deputy Director of Centre for Technology in Water and Wastewater, Co-Director of Joint Research Centre for Protective Infrastructure Technology and Environmental Green Bioprocess, School of Civil and Environmental Engineering, Faculty of Engineering and Information Technology, University of Technology Sydney. He has been duly elected as Fellow of International Water Association (FIWA) and Fellow and Lead Researcher of the International Bioprocessing Association (FIBA and LRIBA) and serving as IBA Council Member. He has also served as Co-director of Collaborative Membrane Bioreactor Center.

Ngo is internationally well-known for his activities in the areas of advanced biological waste treatment technologies (e.g. membrane bioreactor, specific attached and/or suspended growth bioreactors, anaerobic digesters, wetland and bio-sorption) and membrane technologies. His expertise and practical experience also covers the areas of water and wastewater quality monitoring and management, water and wastewater treatment reuse technology and assessment, desalination, and solid waste management. Currently, his activities focuses more on the development of specific green bioprocessing technologies: resources recovery, water - waste - bioenergy nexus and greenhouse gas emission control.

Ngo has published more than 500 technical papers (including > 400 SCI/ISI journal papers, > 100 conference papers, 4 books and 28 book chapters (Google citation > 11,200 and h-index = 52, Google - August 2018) and a number of patents while receiving several highly recognized honors/awards. He has been invited to give numerous plenary/keynotes and invited talks, seminars and lecturers in the international conferences as well as the universities/research institutions.

Ngo has appointed as Editor of a high impact journal - Bioresource Technology, Elsevier (IF = 5.807). He is also a founder and Editor in Chief of *Journal of Water Sustainability* while being editorial board member of numerous international journals such as *Science of the Total Environment*, Elsevier, *Environmental Nanotechnology, Monitoring and Management*, *Elsevier, Bioresource Technology Reports, Elsevier; Journal of Advances in Environmental Chemistry*, Hindawi, *and Journal of Energy and Environmental Sustainability,* IJSEES.

Dr. Mathava Kumar S, is an Associate Professor in the Department of Civil Engineering, IIT Madras. His research interests include wastewater treatment using biological processes, membrane (bio)reactors, emerging pollutants removal by advanced oxidation processes and adsorption. Dr. Mathav has published several quality journal publications in the area of water and wastewater treatment. Currently, he is one of the institutional members for water quality sectional committee (CHD36) of BIS.

Course Coordinator

Name: Dr. Mathava Kumar S
Associate Professor
Department of Civil Engineering
Indian Institute of Technology Madras
Chennai – 600036.

Phone: (044) 22574267
E-mail: mathav@iitm.ac.in

.....

For detailed syllabus please look at:
URL: http://www.civil.iitm.ac.in/mathav_edu