Algal and Bacterial Bioreactor Systems Design for Sustainable Wastewater Treatment

……

Overview

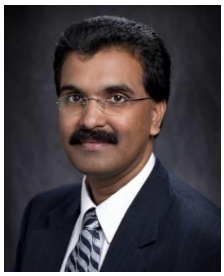
The rapid population growth, urbanization as well as industrialization have significantly increased the release of wastewater into the environment. Commonly, conventional domestic wastewater treatment schemes were centred around bacterial decomposition of carbonaceous loads and lowering suspended solids. However, the penetration of trace organic compounds, heavy metals, nutrients and other emerging pollutants through the effluents of wastewater treatment plants have been reported across the globe. The failure of conventional treatment schemes could be due to the poor understanding of microbial biochemistry and stoichiometry, lack of fundamental understanding of the bioreactor design and its kinetics, and complexity of the nature of pollutants released. Recently, considerable attention has been provided on the incorporation of algal biosystems as part of the domestic wastewater treatment process for better removal of nutrients, heavy metals and certain organic compounds. Moreover, there exists a lot of scope for developing hybrid systems combining algae and bacteria, which can alleviate the problem of environmental contamination via wastewater disposal.

The major objectives of the course are as follows: (I) Accentuate the role of algae and bacteria in wastewater treatment using their metabolic biochemistry, stoichiometry, growth kinetics and stress the importance of sustainable wastewater treatment, (ii) Advance the understanding of different bioreactor operations using fundamental concepts along with hands-on simulation software, and improve the know-how of bioreactor design and modelling via design examples and successful real-time working examples, (iii) Enable the participants to gain further understanding of ways for designing sustainable wastewater treatment systems through internal energy recirculation, and (iv) Familiarize the participants for developing hybrid wastewater treatment systems combing algal and bacterial microorganisms, and also for retrofitting the existing wastewater treatment systems.

Course Information	**Dates – 4th to 9th Dec, 2023** **Algal and Bacterial Bioreactor Systems Design for Sustainable Wastewater Treatment**
You Should Attend If…	▪ you are an environmental/chemical engineer or research scientist interested in understanding the conceptual design of biological systems especially for biosystems for nitrogen removal from different wastewaters. ▪ you are an engineer interested in learning the circular economy concepts through recovery of energy from wastewater via the application of algal and bacterial systems. ▪ you are an undergraduate or post-graduate student, research scholar, researcher and/or a faculty member of an academic institution, and motivated to learn fundamental as well as advanced research on algal and bacterial bioreactor systems for sustainable wastewater treatment. **Number of participants for the course will be limited to fifty.**
Fees	The participation fee for taking the course is as follows: **Participants from abroad : US $ 500** **Students : INR 1000** **Faculty : INR 2500** **Industry / Research Organizations : INR 10000** **Government Organizations : INR 5000**

	The above fee includes all instructional materials including lecture notes, tutorials and assignments. **Modes of payment:** Online transfer: Click here to pay: https://elearn.nptel.ac.in/gian/
Accommodation	The participants may be provided with hostel accommodation, depending on availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel/
Registration Procedure	Please follow the following steps for the registration: 1. Go to GIAN website (http://www.gian.iitkgp.ac.in/GREGN/index) First time users need to register and pay a one-time fee of INR 500 / 2. Enroll for the course: **Algal and Bacterial Bioreactor Systems Design for Sustainable Wastewater Treatment**. Once you enrol for the course, an Enrolment/Application number will be generated, and the course coordinators will be notified.

The Faculty

	Dr. Chandra S. Theegala is currently working as a professor in the Biological and Agricultural Engineering Department (BAE) at Louisiana State University, USA. He routinely teaches biological reactors, sustainable energy, and transport phenomena courses at the senior and graduate level. On the research front, he works primarily in the areas of renewable energy, bioenergy, bio and algal reactors, byproduct utilization, and waste treatment. He specializes in developing novel and patentable engineering technologies for commercial deployment. He is currently serving on the editorial board for Algal Research Journal, which is one of the most prestigious peer-reviewed journals in the algal arena.
	Dr. S. Mathava Kumar is an Associate Professor in the Department of Civil Engineering, IIT Madras. Dr. Mathava Kumar's research interest includes Membrane technology for water purification and tertiary wastewater treatment, advanced oxidation processes (AOPs) for emerging pollutants removal, algal systems for nutrient removal, and hybrid-reactors for sustainable industrial wastewater treatment.

Course Co-ordinator

Dr. S. Mathava Kumar
Phone: +91-44-22574267
E-mail: mathav@civil.iitm.ac.in

.....

https://civil.iitm.ac.in/faculty/mathava/