



Pune Knowledge Cluster in collaboration with Agharkar Research Institute presents

COURSE ON MICROBIAL PROCESSES FOR ENERGY RECOVERY FROM ORGANIC WASTES

Organized By	Pune Knowledge Cluster (PKC)
In Collaboration With	Agharkar Research Institute, Pune
Date	Start Date: 15 th February 2021 End Date: 26 th February 2021
Location	The course is conducted on an online platform
Course Duration	The course will consist of 12 online sessions followed by 2 days of laboratory demonstrations in the laboratories of Agharkar Research Institute, Pune
Course Description	Abundant energy is available in various wastes, especially in lignocellulosic biomass and the organic fraction of municipal solid wastes. Lignocellulosic biomass represents the polymeric forms of several fermentable sugars, mainly glucose and xylose. These trapped sugars, if hydrolysed efficiently from cellulose and hemicellulose, can directly be fermented to biofuels like biohydrogen, bioethanol, biomethane, or biobutanol. The course will provide academic as well as industrial perspectives about different biofuels and their microbial production methods. The participants will gain basic knowledge of different types of microbes and their potential role in anaerobic processes for energy recovery from organic wastes.
For whom	Doctoral students, post-doctoral fellows Young investigators from industry and academia, research/science managers, CTOs, CSOs, in research/technology organizations, technology incubators, etc. in and around Pune
Trainers	Dr. Prashant K Dhakephalkar, Director, Agharkar Research Institute Dr. Dilip Ranade, Ex-director, Agharkar Research Institute Dr. Sumit Singh Dagar, Scientist D, Agharkar Research Institute Dr. Monali Rahalkar, Scientist D, Agharkar Research Institute Dr. Karthick Balasubramanian, Scientist D, Agharkar Research Institut Dr. Abhishek Baghela, Scientist D, Agharkar Research Institute Mr. Pranav R Kshirsagar, Scientist D, Agharkar Research Institute



	<p>Dr Vikram B Lanjekar, Tech Officer B, Agharkar Research Institute</p> <p>Mr. Sumedh Bapat, CEO, Tattva Consultants</p> <p>Dr. Nitant Mate, Managing Director and Partner, SeeGreen Solutions LLP</p> <p>Ms. Srideepika Sivakumar, Research Process Manager – Mailhemikos</p> <p>Mr. Sameer Rege, CEO, Mailhem IKOS</p> <p>Mr. Kaustubh Pathak, Tech Lead Alternative Fuels, KPIT Technologies Limited</p>
Number of Seats	The maximum number of participants will be limited to about 20
Registration Fees	There is no registration fees



COURSE ON MICROBIAL PROCESSES FOR ENERGY RECOVERY FROM ORGANIC WASTES

Topic	Speaker
Omics Tools and Techniques in Anaerobic Digestion Processes	Dr. Prashant K Dhakephalkar, Director, Agharkar Research Institute
Biobutanol Production	Dr. Dilip Ranade, Ex-director, Agharkar Research Institute
Anaerobes for Energy Recovery from Agro-wastes	Dr. Sumit Singh Dagar, Scientist D, Agharkar Research Institute
Methanotrophs for Biomethanol Production	Dr. Monali Rahalkar, Scientist D, Agharkar Research Institute
Diatoms for Biofuel Production	Dr. Karthick Balasubramanian, Scientist D, Agharkar Research Institute
Specialized Yeasts for 2G/ Bioethanol Production	Dr. Abhishek Baghela, Scientist D, Agharkar Research Institute
Fermentation Processes	Mr. Pranav R Kshirsagar, Scientist D, Agharkar Research Institute
Home Biogas	Mr. Sumedh Bapat, CEO, Tattva Consultants
Extracting Energy from Biomass: Opportunities and Challenges	Dr. Nitant Mate, Managing Director and Partner, SeeGreen Solutions LLP
Energy from Municipal Solid Waste	Ms. Srideepika Sivakumar, Research Process Manager - MailhemIkos
Commercial Plants for Waste to Energy	Mr. Sameer Rege, CEO, Mailhem IKOS
Innovations in Hydrogen Generation	Mr. Kaustubh Pathak, Tech Lead Alternative Fuels, KPIT Technologies Limited

About the speakers



Dr. Prashant K Dhakephalkar, Director, Agharkar Research Institute

He is working as the Director, Agharkar Research Institute. His major research interest is in investigating the microbial diversity associated with extreme, pristine and other habitats for taxonomic novelty and industrial applications (especially Bioenergy, Petroleum Biotechnology and Bioremediation). His group works on collecting samples from a variety of extreme and pristine habitats including (but not limited to) volcanic mud, deep subsurface high temperature oil reservoirs, submarine methane. He completed Ph.D. (in Microbiology) and worked as Research Associate at University of Virginia, Charlottesville, USA (1998-2000) and Scientist in Microbiology Department.



Dr. Dilip Ranade, Ex-director, Agharkar Research Institute

Dr Dilip Ranade is an eminent scientist, and ex-director of Agharkar Research Institute. He holds a PhD in microbiology and worked more than 36 years in the field of anaerobic fermentation and biogas technology. His research has mainly focused on biomethane, biohydrogen and biobutanol production from various industrial and agro-wastes. He has successfully handled several research projects given by the government (DST, DBT, CSIR, MNRE, MAIDC) and industries (ONGC, NTPC, Reliance, Praj, Hindustan antibiotics, etc.). His research findings on “optimization of cattle dung biomethanation process” formed the scientific basis to decide operational parameters for biogas plants recommended by the Government of India. He is a recipient of UNESCO-ROSTSCA Young Scientist Award in 1985, and a fellow of Maharashtra Academy of Science, and Association of Microbiologist of India. Post-retirement, Dr Ranade served as a consultant to NCMR (NCCS, Pune) and Noble Exchange Environment Solutions LLP, Pune. Currently, Dr Ranade is actively serving as Advisory Committee member, R&D, ONGC Energy Centre (New Delhi), and as a consultant in KK Nag Pvt Ltd. (Pune).



Dr. Sumit Singh Dagar, Scientist D, Agharkar Research Institute

He studies anaerobic microorganisms (bacteria, fungi, methanogens) for energy recovery from various organic wastes. He completed his Ph.D. from National Dairy Research Institute, Karnal.



Dr. Monali rahalkar, scientist d, agharkar research institute

She has more than 10 years of research experience in biotechnology. Her primary interests lie in combining novel cultivation strategies and modern day molecular approaches to study bacteria from a variety of habitats.



Dr. Karthick Balasubramanian, Scientist D, Agharkar Research Institute

He is a Scientist at the Biodiversity and Palaeobiology Group, Agharkar Research Institute, Pune. He studied the community structure of stream diatom communities of the Western Ghats for his PhD at Indian Institute of Science, Bangalore and Mysore University. In 2010, he joined the Natural History Museum of the University of Colorado at Boulder, the USA for his postdoctoral research, where he studied the taxonomy of endemic diatoms of the Indian subcontinent. He joined the North-West University, South Africa in 2013 to work on the endemic diatoms of Southern Africa.

He is currently studying the diversity and distribution of diatoms across the Indian subcontinent and applying this information in the monitoring of water quality, biofuel, paleoenvironment reconstruction, and environmental education. He has discovered nearly 30 new diatoms from Africa, America, and Asia and revised more than 50 species. He is also involved with environmental educational activities using diatoms as an educational tool. A diatom genus “Karthickia” is named after him to recognise his contribution to diatom research. Dr Karthick is also an excellent science communicator and educates school children related to biodiversity and environmental research.



Dr. Abhishek Baghela, Scientist D, Agharkar Research Institute

He is an alumnus of School of Life Sciences, Devi Ahilya Vishwavidyalaya (DAVV), Indore from where he earned a MSc in Industrial Microbiology. He did his doctoral studies at Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh to secure a PhD in Molecular Mycology. He did a short postdoctoral fellowship in USA at Wayne State University Detroit, MI. Then he joined Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore in 2011, as DBT – postdoctoral research associate at Molecular Biology and Genetics Unit. At JNCASR he worked on yeasts hybrids. He also worked as a Scientist & Group Leader at XCyton Diagnostics Pvt. Ltd. Bangalore. After working in diverse fields like industrial microbiology, molecular diagnostics and yeast biology, he joined National Fungal Culture Collection of India (NFCCI), Agharkar Research Institute, Pune as a Scientist in 2014. He is actively involved in research on taxonomy, ecology and applications of yeasts. His special interest lies in high temperature ethanol production using non-conventional yeasts.



Dr. Pranav R Kshirsagar, Scientist D, Agharkar Research Institute

The preliminary phases of process and product development rely on experimentation programmes. Such experiments can be costly and time consuming. A statistical based approach can have significant advantages to reduce such experimentation time, experimentation cost, and provide more information about both process and engineering design. Their laboratory objective is to explore the statistical techniques which have capabilities of describing process accurately and increase the efficiency of process for different processes involved in aerobic and anaerobic fermentation processes.

He completed B.E. in Chemical Engineering, Shivaji University, Kolhapur and M. Tech. in Chemical Engineering, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad. His interested is in studying the statistical optimization, kinetics and modeling, mass and energy balance, upscaling of fermentation processes, bioenergy, and techno-economic evaluation of processes.



Mr. Sumedh Bapat, CEO, Tattva Consultants

He is the Founder of Tattva Consultants, Pune. He has an experience of 17+ years in the biogas industry. He has served as a Technical Director on the board of several companies including a Indo-German venture. Before beginning his own venture in advising technical design and engineering consultancy. Mr. Sumedh has designed, engineered, built and operated large scale biogas plants on press mud, spent wash and organic Municipal Solid Waste. He is also associated with ministry of New & Renewable Energy appointed committee for making Biogas Plant standards in India.

He has gathered significant operational excellence and experience on managing the MSW ecosystem, handling and operating large biogas to Compressed Biogas plants.

Mr. Sumedh advises and provides technical services to several companies on the Biogas and waste to energy front including Shell Markets India Ltd., Dun & Bradstreet, Energim Sustainable Solutions Pvt. Ltd and Homebiogas Ltd., Israel.



Dr. Nitant Mate, Managing Director and Partner, SeeGreen Solutions LLP

He is committed to development, demonstration and dissemination of decentralized sustainable solutions that are ecologically friendly, economically viable, and socially acceptable. His area of work includes solar, biogas, vegetable oil, biodiesel, biomass gasification, wind, etc. He is also keen on management of waste, air and water quality. He completed Mechanical Engineering, Colorado State University.

Ms. Srideepika Sivakumar, Research Process Manager – Mailhemikos

Since 2014 she has been associated with Mailhem group first as process engineer and now as Research process manager. Srideepika has completed bachelors in biotechnology from Anna university, Chennai and masters in Industrial biotechnology with specialization in resource and energy recovery from university of boras, Sweden. With 6 plus years of experience in the field of solid waste management, Srideepika has worked on more than 30 different substrates from food processing waste, industrial waste, and organic fraction of MSW for lab and pilot scale. With technical expertise in UASB and CSTR digester, she has been successful to provide tailor made waste treatment solutions to industries. She has actively led and been part of the team for process design, planning, and start-up of anaerobic digester of capacity upto 100 tons per day.



Mr. Sameer Rege, CEO, Mailhem IKOS

Since 1998, Sameer has been actively leading, first as Managing Director in Mailhem Engineers and now as the CEO of Mailhem Ikos. He has executed more than 300 projects spread across the length and breadth of India.

A graduate chemical engineer from Bharati Vidyapeeth College of Engineering, Pune, Sameer was always keenly interested in environmental management. Having specialized in Environmental Design from Vishwakarma Institute of Technology (VIT), Pune, he has since spearheaded the business of Mailhem Engineers. Under his guidance Mailhem has successfully installed and commissioned 15TPD Biomethanation Plant for Indore Smart City Development Corporation Ltd on Engineering Procurement and Construction (EPC) Basis and Mailhem is operating the same plant for last 3 years. In this case by-products generated from the biomethanation plant are the property of Indore Smart City Development Corporation Ltd. 500kgs of Compressed Biogas generated from this plant is filled into 6 to 7 buses of Indore Smart City.



Mr. Kaustubh Pathak, Tech Lead Alternative Fuels, KPIT Technologies Limited

He has over 12 years of combined experience in Technology Assessment and Technology Development in the Renewable Energy Sector. He has a strong analytical mindset with a strong technical background to generate insights and actionable recommendations. He is working as Tech Lead Alternative Fuels, KPIT Technologies Limited and supports in creating project business cases and in estimating realistic efforts required to execute the projects. He also handles communications with various stakeholders for business development. He has also developed dashboards and models for technology and economics analysis required to create multiple business scenarios. He has contributed as a co-author for the policy document “Progressive Maharashtra: Policy Road Map 2019-2024” released by Pune International Centre in September 2019.



About the organizer:

The Pune Knowledge Cluster (PKC) has been established by the Office of the Principal Scientific Adviser to the Government of India. The aim is to bring together academia, R&D institutions and the industry of Pune and its surrounding areas, to address the challenging problems of the region through innovative means, using scientific knowledge and engaging highly skilled human resources. Furthermore, PKC aims to foster capacity building and promote skills development and entrepreneurship among the students and professionals of the city. All relevant organizations and experts will be partners and consulted to identify sustainable solutions to the problems of the city and improve its liveability and prosperity.

While the PKC is administered by the Inter-University Centre for Astronomy and Astrophysics (IUCAA), it is a project of and for the whole city. In the initial phase, PKC would focus on air, water, health, and sustainable mobility.

For more information, visit: <https://www.pkc.org.in/>



The Institute, founded in 1946 as the Maharashtra Association for the Cultivation of Science Research Institute, was renamed in 1992 as the Agharkar Research Institute (ARI) in honour and memory of the Founder Director, the late Professor Dr. Shankar Purushottam Agharkar. The ARI is an autonomous research institution fully funded by the Department of Science and Technology (DST) government of India, since 1966. It operates under the overall umbrella of the Maharashtra Association for the Cultivation of Science (MACS).

The institute is committed to the promotion of science and technology with emphasis on high standards of research and development activities for the benefit of human kind and the nation.