

### ❖ Overview of the Course:

The improvement in standards of human living style and urbanization has resulted in high rates of resource consumption patterns. The waste generated from urban living is classified broadly into two categories viz., liquid and solid waste. The liquid waste generated is collected through the sewerage system whereas the solid waste generated is collected by the urban bodies. Liquid wastes collected are handled using centralised treatment facilities using aerobic and anaerobic systems whereas the organic fraction of solid wastes collected are treated with aerobic treatment options such as composting or anaerobic options such as biomethanation. The problems associated with waste disposal have also provided a window of opportunity for cities to find solutions involving the community, government, and private sector; adopting environmental friendly technologies and disposal methods.

There is a clear need to introspect the current approach of municipalities in dealing with the waste disposal/recycling issues. The task can be accomplished by involving public-private partnerships aiming for eventual waste minimisation at the community level, and using low energy resources. One of the main reasons for the failure of treatment technologies adopted by the urban areas is the use of energy intensive systems for the treatment.

Adoption of less energy requirement systems will reduce the financial burden on the urban bodies and these systems will also augment with additional revenue in case anaerobic systems are used for waste management. These systems will also provide more employment opportunities if adopted as decentralised systems and will also reduce the transportation costs currently incurred by the urban bodies.

The anaerobic systems used for the treatment of liquid and solid waste are different in its configuration and operation. There are various technical aspects related to the operation and maintenance of these systems. The course is aimed at highlighting the strategies related to the design, operation and maintenance of anaerobic systems to manage the wastes collected in urban areas.

### ❖ Course Objectives:

The primary objectives of the course are to:

- Expose the participants to the fundamentals of sources, characterization and variation of quality of organic wastes generated in the urban environment.
- Introduce the elements of anaerobic wastewater treatment systems for urban organic wastes for their treatment and energy generation.
- Learn to develop sustainable models for effective organic waste management in urban areas for maximizing the energy generation.
- Provide exposure to practical problems and their solutions, through case studies and live projects in the anaerobic systems for biogas production.
- Enhance the capability of the participants to plan, design and operate the anaerobic systems for urban waste management.

### ❖ International Faculty:

**Prof. Irimi Angelidaki**, an acclaimed researcher would be the international faculty for the course. She received her PhD in Biotechnology, from the Technical University of Denmark, Denmark and is associated with the university holding various positions since 1994. She had served in committees and worked with a range of organizations and research bodies. Among others, she is : Member of the Danish Free Research Council - Research for Technology and production, (FTP); Chair for the Swedish Energy Research (Formas); Member for The Panel 7 under the Swedish Research Council (Videnskabsrådet); The European Research Council's (ERC) panel, for starters/ consolidators for the Life Science program (LS9); Irish Research Council as panel member; Member of external evaluation committee for the Swiss Commission for Technology and Innovation (CTI) Energy funding programme; Member of the EU Advisory board for Nanotechnology Materials and Industrial Biotechnology; Chair for the International Task Group for Harmonisation of Biogas potential ABAI (under IWA); Member of the International Tasks Group for Mathematical modelling of the Anaerobic processes (under IWA); Board Member (representing North Europe) for the Specialist Group for Anaerobic Processes (under IWA).

**Prof. Irimi Angelidaki** research interests are primarily in wastes/wastewater treatment systems with focus on development of biotechnological processes for conversion of organic matter to biochemicals and bioenergy. Research in biogas is her core area.

Focus in microbiology and processes technology; process optimization; molecular methods for characterization of bacteria; biological production of hydrogen; microalgae; macroalgae; bioelectrochemistry; and biorefineries.

### ❖ Who can participate?

This program is open to the Faculty, Research scholars, and M.Tech/M.E. students working in the areas of Environmental Engineering, Chemical Engineering, Biotechnology and Water Resources Engineering from various Institutes. Engineers working in Urban Local Bodies, Industries, Consultancy firms, R&D laboratories can also participate.

### ❖ How to Register?

#### Stage-1: Web Portal Registration:

Visit <http://www.gian.iitkgp.ac.in/GREGN/index> and create login User ID and Password. Fill up the blank registration form and do web 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.

#### ❖ Stage-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 "Strategies for Increased Biogas Generation in Municipal Anaerobic Digesters" from the list and click on save option. Confirm your registration by clicking on Confirm Course.

#### ❖ Registration Fee:

<b>Faculty</b>	<b>Rs. 2,000/-</b>
<b>Participants from Industry / Research Organizations</b>	<b>Rs. 4,000/-</b>
<b>Students &amp; Scholars</b>	<b>Rs. 1000/-</b>
<b>Participants from abroad</b>	<b>US \$ 50</b>
<b>Students</b>	<b>US \$ 100</b>
<b>Faculty</b>	<b>US \$ 100</b>

The Registration fee includes instructional material, laboratory use and session teas. **The outstation participants will be provided with boarding and lodging on additional payment of Rs. 4,000/- in Student Hostel on sharing basis.**

### ❖ Selection and Mode of Payment:

Selected candidates will be intimated through e-mail. They have to remit the necessary course fee to the Bank as per the details given below.

**Outstation participants requiring accommodation and boarding facilities have to pay Rs. 4,000/- in addition to the course fee.**

Account Name	GIAN NITW
Account No.	62447453600
Bank	State Bank of India
Branch	REC Warangal (NIT Campus)
Branch Code	20149
IFSC	SBIN0020149
MICR Code	506004011
SWIFT Code	SBININBB018

Candidates registering early will be given preference in the short listing process. For any queries regarding registration of the course, please contact the Course Coordinator:

#### **Dr. P. Venkateswara Rao**

Course Coordinator

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#### **Prof. K.V. Jayakumar**

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### ❖ About GIAN Course:

Ministry of Human Resource Development (MHRD), Government of India (GoI) has launched an innovative program titled “Global Initiative of Academic Networks (GIAN)” in higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country’s academic resources, accelerate the pace of quality reforms and elevate India’s scientific and technological capacity to global excellence.

### ❖ About the Institute and Warangal:

National Institute of Technology, Warangal (NITW) formerly known as RECW is the first among seventeen RECs set up in 1959. Over the years, the Institute has established itself as a premier Institution in imparting technical education of a very high standard, leading to B.Tech, M.Tech and Ph.D. programmes in various specializations of Science and Engineering streams. Warangal is known for its rich historical and cultural heritage. It is situated at a distance of 140 km from Hyderabad. Warangal is well connected by road and rail. National Institute of Technology, Warangal campus is 3 km away from Kazipet railway station and 12 km away from Warangal railway station. The nearest airport is Hyderabad.

### ❖ About the Department

The Department of Civil Engineering offers B.Tech programme in Civil Engineering, 7 M.Tech programmes including Transportation Engineering and PhD programme. The Department is a recognized QIP centre since 1978. The Department has well established and well equipped laboratories. The Department has experienced faculty engaged in teaching, research, capacity building activities and industry extension services. Faculty members represent several policy making and professional bodies. The Department has liaison with reputed industries and R&D organizations.

Water & Environment Division is one of the four divisions in the Department of Civil Engineering and presently offers two M.Tech programs, one in Water Resources Engineering and the other in Environmental Engineering, besides the PhD program. Many field engineers have obtained their Master’s degree working in the division. The division has well qualified, motivated and experienced faculty members.



**5 Days GIAN Course on**

## **STRATEGIES FOR INCREASED BIOGAS GENERATION IN MUNICIPAL ANAEROBIC DIGESTERS**

**27<sup>th</sup> August – 1<sup>st</sup> September, 2018**

**Call for Registration and Participation**

**International Faculty**

**Prof. Irini Angelidaki**

**Head, Bioenergy Research Group**

**Department of Environmental Engineering  
Technical University of Denmark, Denmark**

**Course Coordinators**

**Dr. P.Venkateswara Rao**

**Prof. K. V. Jayakumar**

**Water & Environment Division  
Department of Civil Engineering  
National Institute of Technology Warangal  
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