Advanced wastewater treatment with high energy efficiency and value-added product recovery

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Overview

Municipal and industrial wastewater (WW) treatment has become an integral part of human activity for safe environment and human health.

Wastewater treatment priority is to keep the organic, inorganic, pathogenic and toxic contaminants under control and requires an elaborate establishment. While simple technologies can provide means to remove the organic pollutants; removal of priority pollutants and nutrients requires advanced technologies. Recently, many advances have been made to respond to the needs of removal of nutrients and priority pollutants. These advances shall be discussed during this presentation. On the other hand, wastewater can become a source of value and economic gain if its treatment is re-oriented to emphasize the recovery of water, energy, nutrients, and, in some cases, other materials. This session will focus on emerging processes and systems of processes whose primary goal is recovering the resources present in wastewater. Examples include conversion to lipids, biodiesel and other value-added chemicals.

Further, this presentation will review the state-of-the-art technologies for wastewater sludge (WWS) reduction. They include chemical, mechanical, thermal, electrical treatment, addition of chemical un-coupler, and predation of protozoa/metazoa in wastewater treatment line, and physical, chemical and biological pre-treatment in sludge treatment line. Emphasis shall be on diversion of carbon contained in sludge towards value added products. However, thermal pre-treatment is superior to other pre-treatment technologies when pathogen inactivation is required. The new wastewater treatment processes, high-rate activated sludge coupled autotrophic nitrogen removal and anaerobic membrane bioreactor coupled autotrophic nitrogen removal also have a great potential to reduce sludge production. In the future, an effort should be put on the effect of sludge reduction technologies on the removal of organic micropollutants, heavy metals and recycle the waste carbon to value added products. These aspects shall be discussed during the proposed course work.

Objectives

The overall goal of the series of lecture is as follows:

1. To expose the participants to the current practice and recent advances in wastewater treatment and sludge disposal technologies.
2. To establish that the waste carbon is no more waste instead can serve as a source of energy and chemicals.
3. How the carbon contained in wastewater can be converted into bioenergy and marketable value-added products
4. The new emerging green technologies of bioconversion of wastewater can help in reducing greenhouse gases and impact the climate change.

Modules	**Duration : September 2 – September 7, 2018 (6 days)** **Venue : Department of Civil Engineering, NIT Patna** **Number of participants for the course will be limited to 50 (fifty) only.**
You Should Attend If…	▪ **Executives, engineers and researchers from manufacturing, service and government organizations, including R&D laboratories.** ▪ **Student at all levels (B.Tech/M.Sc/M.Tech/PhD) or faculty from reputed academic institutions and technical institutions.** ▪ **Faculty from reputed academic institutions and technical institutions.**
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $500** **Industry/ Research Organization : Rs 5,000/-** **Faculty : Rs.3,000/-** **Student : Rs 1,000/-** The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty

Prof. R. D. Tyagi is an internationally recognized Professor of Biochemical Engineering and biotransformation with 'Institut national de la recherche Scientifique – Eau, terre, et environnement', (INRS-ETE), University of Québec, Canada. He is also Adjunct Professor at University of Missouri Columbia (USA) and AMEITY Rajasthan (India).

Prof Tyagi holds Canada Research Chair and is the member of Hall of Excellence of University of Québec. He is also a member of **European Academy of Sciences and Arts**; Academician, European Academy of Sciences & Arts.

He conducts research on water/wastewater treatment, wastewater sludge treatment/disposal, bioconversion of wastewater and wastewater sludge into value added products (biopseticides, bioplastics, biodiesel) and hazardous/solids waste management.

He has developed the novel technologies of simultaneous sewage sludge digestion and metal leaching, bioconversion of wastewater sludge (biosolids) into *Bacillus thuringiensis* based biopesticides, bioplastics, biofertilisers, biocontrol agents and biodiesel.

He has voluntary served on the Boards of several professional organizations and on the panel of several granting agencies. International Water Association, board of specialist group on, 'Appropriate Technology for Developing Countries'. He is currently on the Executive Committee of the Canadian Association on Water Quality He has supervised 30 M.Sc. and more than 50 Ph.D. students.

Tyagi has published/presented over 500 research articles in refereed scientific international journals, conferences proceedings and is the author of 12 books, eighty-six book chapters, ten research reports, nine patents, invited national and international conferences lectures as well as key note lectures in various scientific conferences. He is Associate Editor of ''*Practice Periodical of Hazardous, Toxic & Radioactive Waste Management- Am.Soc.Civil Engineering*'' and serves on the editorial board of ''*Process Biochemistry*'' for the last 25 years.

His research on «bioconversion of wastewater sludge to value added products» has been recognized internationally and has received many **National** and **International Awards.**

For more information:
Personal Home Page: http://www.inrs.ca/rajeshwar-dayal-tyagi

Co-ordinator

Dr. Nityanand Singh Maurya is an associate professor of environmental engineering in Civil & Environmental Engineering at NIT, Patna. He obtained his Bachelor in Civil Engineering from MIT Muzaffarpur, M.Tech in Environmental Science and Engineering, NERIST Itanagar and PhD in Civil Engineering (environmental engineering) from IIT Delhi. He researches in Adsorptive processes, microbiological quality of drinking water, faecal sludge management, resource recovery, GHG emissions from sanitation options and wastewater treatment systems.

For more information:
https://scholar.google.com/citations?user=ACKI2bEAAAAJ&hl=en

Course Co-ordinator

Dr. Nityanand Singh Maurya
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E-mail: nsmaurya@nitp.ac.in

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MHRD sponsored GIAN course

On

Advanced wastewater treatment with high energy efficiency and value-added product recovery

September 2 –7, 2018

REGISTRATION FORM

Name: _____

Designation: _____

Department: _____

Organisation: _____

Academic Degree: _____

Address for correspondence: _____

_____

Phone: _____

E-mail: _____

Category of participant:
Faculty/Student/Research Scholar of NITP
Faculty/Student/Research Scholar of other Institutes
Industry Participant
Foreign Participant

Payment Details:
(should be attached with this form)

Amount Transferred: .....,
(To the account number 50399114681)
Reference ID: .....,
Dated: .....…

I agree to attend the course for the entire duration.

Signature of the applicant

Signature of the sponsoring authority with Seal (if any)

Fees Receipt

Received with thanks from _____ a sum of Rs._____ towards the registration fee for the GIAN course "Advanced wastewater treatment with high energy efficiency and value-added product recovery" organized by NIT Patna during September 02-07, 2018.

Dr. Nityanand Singh Maurya
Course Coordinator

Course Fee:

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Faculty : Rs.3,000/-

Student : Rs 1,000/-

The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.

Mode of Payment: ***Electronic Fund Transfer or Demand Draft***

Name of the Bank	Allahabad Bank
Address of the Bank	NIT Patna Campus, NIT Patna, Patna – 800005
Account Name	NIT PATNA GIAN PHASE II
Account No.	50399114681
IFSC code	ALLA0212286

Register for the course online at http://www.gian.iitkgp.ac.in/

Address for all Correspondence:

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