

## The Faculty



**PROF. CHITTARANJAN RAY** is presently Professor and Director of Nebraska Water Center, University of Nebraska–Lincoln. Prof. Ray was a Professor of Civil and Environmental Engineering at the University of Hawaii at Manoa, where he also was interim director of the Water Resources Research Center at UH, which is part of a network of more than 54 water resources research institutes in USA that were established by US Congressional mandate in 1964. The holder of a Ph.D. in civil engineering from the University of Illinois, he has extensive experience in many facets of managing both water quantity and water quality issues. He is a pioneer in research on riverbank filtration for water supply, soil and ground water contamination from agricultural activities, and hazardous waste management.



**DR. RAJESH ROSHAN DASH** is an Associate Professor of Environmental Engineering in the School of Infrastructure at IIT Bhubaneswar. Prior to joining IIT Bhubaneswar in 2010, he was a faculty member in NIT Hamirpur and MNNIT Allahabad. Dr. Dash received his Ph.D. in Environmental Engineering from IIT Roorkee. His major research focus is on Treatment of Domestic and Industrial wastewater, and management of solid and hazardous Waste.



**DR. MANASWINI BEHERA** is an Assistant Professor of Environmental Engineering in the School of Infrastructure, IIT Bhubaneswar. She has received her Ph.D. in Environmental Engineering from IIT Kharagpur. She has joined IIT Bhubaneswar in 2014. Prior to joining IIT Bhubaneswar Dr. Behera was associated with VSSUT, Odisha and NIT Rourkela. Her area of research is bioenergy recovery during treatment of industrial wastewater and solid waste in microbial fuel cell, grey water treatment and reuse.

## Registration Process

### Step 1: Onetime Registration in GIAN webportal

Interested participants will have to get registered by visiting the GIAN web portal on the following link on payment of a onetime non-refundable fee of Rs. 500 (excluding the participation fee as mentioned below) through online payment gateway:

<http://www.gian.iitkgp.ac.in/GREGN/index>

### Step 2: Course Registration

Participants need to fill the registration format attached and deposit a course registration fee (as mentioned below) via online transfer or Demand Draft in favour of “CEP, IIT Bhubaneswar” (A/C No.: 24282010001960; IFSC Code: SYNB0002428; Bank name: Syndicate Bank; Branch: IIT Bhubaneswar). The scanned copy of (a) filled up registration form, (b) Demand Draft or receipt of online transfer and (c) Generated application form in step 1 GIAN webportal must be sent to the course coordinators via email/post.

**Deadline for registration: 30<sup>th</sup> November, 2018**

**Number of participants for the course is limited to 50**

**The course registration fees are as follows:**

- Participants from abroad : US \$200
- Industry/ Research Organizations : INR 4000
- Academic Institutions (Faculty) : INR 2500
- M.Tech./M.Sc. and Ph.D. students : INR 1000
- UG students : INR 500

The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, free internet facility. The participants will be provided with accommodation on payment basis in Hostels/Guest House on prior request. Lodging charges for Guest House-Single deluxe: Rs. 800/day; Guest House-Double deluxe: Rs.1200/day; For Students-Hostel: Rs.150/day.

## Course Coordinators

**Dr. Rajesh Roshan Dash**  
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**Dr. Manaswini Behera**  
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A short-term course on

## Cost Effective and Sustainable Solutions for Management of Hazardous Waste

Under the aegis of MHRD—Global Initiative of Academic Networks (GIAN)

**14-18 December, 2018**

*School of Infrastructure*

*IIT Bhubaneswar*

*Argul, Jatni-752050*

*Khordha, Odisha, India*



Indian Institute of Technology Bhubaneswar

## Overview

Hazardous waste is any unwanted material, the disposal of which poses a threat to the environment. Sources of hazardous waste include hospitals, petrol storage, metal finishing, paint manufacture, vehicle servicing, tanneries, agriculture/ horticulture, electricity distribution and dry cleaning. The management of hazardous waste has dramatically changed and the emphasis has been shifted from site management to site remediation. The Ministry of Environment & Forests, Government of India, notified the Hazardous Waste (Management & Handling) Rules on July 28, 1989 under the provisions of the Environment (Protection) Act, 1986, which was further amended in the year 2000 and 2003 for effective management of hazardous waste (HW), mainly solids, semi-solids and other industrial wastes. The key objectives of these rules are to minimize the hazardous waste in terms of quantity to dispose off as close to the source and reduce the trans boundary movement.

This specialized course intends to impart essential knowledge on various aspects of generation of Hazardous Waste in Indian and Global Scenario, its characterization, sustainable remediation techniques, and monitoring of disposal sites and conducting risk analysis. Participants will be exposed to current treatment practices and scope on development of cost-effective and environmental sustainable alternatives. Both fundamental concepts and practical aspects will be covered with examples and case studies.



## Hazardous Waste Management



## You should attend if.....

- You are faculty from reputed academic institutions and technical institutions and students at all levels (B.Tech./ M.Sc./ M.Tech./ Ph.D.)
- You are Civil, Chemical and Environmental engineer, Planners, Policy makers and Regulators from municipal solid and industrial waste management authorities.

You are Executives, Engineers and Researchers from manufacturing, service and government organizations including R&D laboratories.

## Tentative Lecture Schedule

**Day 1:** Legislations involving hazardous waste disposal and management, source, pathway, receptor analysis, contaminants of concern, hazardous waste generation and management in Indian and World scenario with special reference to some Indian hazardous waste sites, properties and classification of hazardous wastes, waste audits, site assessment, source sampling, priority pollutant and sample analysis.

**Day 2:** Pathways: Partitioning, sorption, and exchange at surfaces, volatilization, chemical structure, abiotic and biotic transformation, transport in the atmosphere and in subsurface, Tutorial 1: Characterisation and quantity estimation of hazardous waste from various sources.

**Day 3:** Receptors: Toxicological consideration, quantitative toxicology; mammalian physiology, mechanisms of toxicity, carcinogenicity, toxic response to common hazardous chemicals, chronic and acute exposures, dose response relationship, hazardous waste risk assessment, Remedial Action risk based clean-up standards, ecological risks, addressing uncertainty in risk assessment. Tutorial 2: Case study: analysis of risk assessment and implementation of management facility.

**Day 4:** Remediation: Pump and Treat technology (PAT), life cycle design, Leachate treatment at landfill sites. Soil vapor extraction (SVE), bioremediation, anaerobic and aerobic technologies, phytoremediation, Tutorial 3: design considerations for PAT and SVE treatments.

**Day 5:** In place closures; waste impoundment closures, source area containment, waste stabilization/fixation, Combinations of technologies and system design, hazardous waste handling, transport and storage facilities, rules and regulations on those facility designs and operations. Tutorial 4. design considerations for bioremediation, Tutorial 5: design of a treatment and safe disposal facility.

**A short-term course on  
Cost Effective and Sustainable Solutions for  
Management of Hazardous Waste  
(approved under the MHRD Scheme on GIAN)**

## REGISTRATION FORMAT

Name [in BLOCK LETTERS]:.....

Designation:.....

Organization:.....

Address:.....

E-mail:.....

Phone (Office):.....(Mobile):.....

Registration Id (from GIAN portal of IIT Kharagpur, enclose copy):.....

Category of Registration:.....

Amount:.....

Payment Method: Demand Draft / NEFT (please tick)

Date: .....Bank Details:.....

Accommodation required: YES / NO (please tick)  
(If YES, please write to coordinator for details)

Date: ..... Signature of Applicant

The completed registration forms along with payment details should be sent to:

**Dr. Manaswini Behera**  
Assistant Professor and Course Coordinator  
School of Infrastructure, IIT Bhubaneswar  
Argul, Jatni, Dsit: Khordha-752050, Odisha, India  
Email: manaswini@iitbbs.ac.in  
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