

GLOBAL INITIATIVE FOR ACADEMIC NETWORKS



National Coordinating Institute
INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

www.gian.iitkgp.ac.in

ENVIRONMENTAL ELECTROCHEMISTRY

Overview

The world-wide awareness to environmental protection and preservation as well as the demand for developing new water resources calls for an interdisciplinary effort in developing new technologies and adopting well established methods for efficient and cost-effective approaches. This course is aimed at presenting electrochemical methods as tools for coping with environmental related problems. Students will study the basics of electrochemistry in order to provide the necessary background. As the course is developed, they will be exposed to electrochemical methods in water treatment: metal precipitation, purification of industrial wastes, electrochemical treatment of organics and production of oxidants. Electrodialysis – an electrochemical membrane water treatment will be discussed in broad. In addition the students will learn the fundamentals of electrochemically-based measuring/monitoring methods and devices such as pH, ORP, reference electrodes, dissolved O₂ etc. Also, different types of fuel cells including microbial fuel cells will be discussed. Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

Modules

Environmental Electrochemistry : 20th June to 29th June 2016

Number of participants for the course will be limited to fifty

Who Should Attend

- This course is designed for B.Tech / M.Tech / PhD students of Civil, Chemical Engineering, Environmental Engineering, Material Science, Biotechnology and Chemistry students, who are likely to be benefited by learning the fundamental and applicative aspects of electrochemical system as related to Environmental issues.
- Faculty members and Research Associates from reputed academic institutions and technical institutions are welcome as well.
- Industrial participants working in electrochemical processes for water and wastewater treatment

Fees

The participation fees for taking the course is as follows:

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| Participants from abroad : | \$ 500 |
| Industry/ Research Organizations: | ₹ 30000 |
| Academic Institutions: | ₹ 10000 |
| Bonafide students of Academic Institutions: | ₹ 1000 (to be refunded after completion of course) |

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. Yoram Oren, is Emeritus Professor at Department of Desalination and Water Treatment, Zuckerman Institute for Water Research, Ben-Gurion University of the Negev, Beer-Sheva, Israel. Most of Prof. Oren's past scientific activity focused on electrochemical-related issues. Within these activities it is possible to identify three different directions: studies in electrochemical methods in relation to treatment of water and waste-water, investigating mass transfer in electrochemical processes and investigating hydrogen transport to metals using electrochemical tools. Within the area of electrochemical water treatment processes, unique and pioneering work was conducted on understanding the electrochemistry of carbon and graphite electrodes, in particular, the double-layer behavior of these materials. Electrosorption of bacteria and colloidal particles and removal of heavy metals on these electrodes were also investigated.



M.M. Ghangrekar, Professor, Department of Civil Engineering, Indian Institute of Technology Kharagpur, is B.E. Civil Engineering, M.Tech. Environmental Engineering and Ph.D. Environmental Science and Engineering. He had been visiting Scientist to Ben Gurion University, Israel and University of Newcastle upon Tyne, UK under Marie Curie fellowship by European Union and had stint as faculty of various capacities in renowned engineering colleges and research institutes. He has been working in the field of anaerobic wastewater treatment, bioenergy recovery during wastewater treatment in microbial fuel cell.

Course Co-ordinator

Prof. M.M. Ghangrekar

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Registration Process

Registration for GIAN courses is not automatic because of the constraints on maximum number of participants allowed to register for a course. In order to register for one or multiple non-overlapping courses, you have to apply online using the following steps:

1. **Create login and password at www.cep.iitkgp.ac.in/gian**
2. **Login and complete the registration form.**
3. **Select courses**
4. **Confirm your application and payment information.**
5. **Pay ₹ 500 (non-refundable) through online payment gateway.**

The course coordinators of the selected courses will go through your application and confirm your selection as a participant one month before the starting date of the courses. Once you are selected you will be informed and requested to pay the full fees through online payment gateway service.

