



## *A one week short term course on*

### **ELECTROCHEMICAL ENERGY CONVERSION AND STORAGE**

**(Sponsored by Ministry of Human Resource Development (MHRD), Under the Scheme 'GIAN')**

**(26 November 2018 to 30 November 2018)**

---

## Overview

In this course, we'll come together to help you to learn about the principles involved and technologies used in creating electrochemical power sources. The course will explore the fundamentals of direct transformation of chemical energy into electricity. You will be introduced to the thermodynamic and kinetic principles of electrochemical power sources functioning, and will see how they work. The focus is on the rechargeable batteries and fuel cells.

The course will be divided into three modules. The topics in Module A will expose the participants to the theoretical base of electrochemical energy conversion. In Module B, modern and perspective types of batteries will be emphasized. Module C will be devoted to low-temperature and high-temperature fuel cells. The topics of the Modules B and C include the description of electrochemical power source devices with special emphasis placed on study of electrode materials and cell reactions.

After completing the course participants will be able to describe current-producing reactions in different electrochemical power sources; have studied a variety of batteries and fuel cells; be clear about the distinction between primary cells and accumulators; gain a broad understanding of physicochemical basics of direct electrochemical energy conversion; be able to solve some applied electrochemistry problems.

<b>Modules</b>	<b>A: FUNDAMENTALS OF ELECTROCHEMICAL ENERGY CONVERSION: Nov 26</b> <b>B: BATTERIES: Nov 27 - Nov 29</b> <b>C: FUEL CELLS: Nov 30</b> <b>Number of participants for the course will be limited to Thirty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>▪ You are a B. Tech. / M. Tech. or M. Sc. with broad domain of energy conversion and storage.</li><li>▪ You are a Post-doctoral fellow or Ph. D. scholar in Chemistry, Physics or Materials Sciences.</li><li>▪ You are a faculty member of an academic institution or a researcher/scientist from industry interested in learning about electrochemical energy conversion and storage.</li></ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$100</b> <b>Industry/ Research Organizations: INR 3000</b> <b>Academic Institutions (Faculty members): INR 1500</b> <b>Ph. D. and M. Tech. Students: INR 1000</b> The above fees include all instructional materials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.

## 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:

### Stage1:

Web (Portal) Registration: Visit GIAN Website at the link:

<http://www.gian.iitkgp.ac.in/GREGN/index> and create login user ID and Password. Fill up blank registration form and do web registration by paying Rs. 500/- on line through Net Banking/ Debit/ Credit Card. This provides the user with life time registration to enroll in any no. of GIAN courses offered.

### Stage2:

Course Registration (Through GIAN Portal): Log in to the GIAN portal with the user ID and Password created. Click on "Course Registration" option given at the top of the registration form. Select the Course titled "ELECTROCHEMICAL ENERGY CONVERSION AND STORAGE " from the list and click on "Save" option. Confirm your registration by Clicking on "Confirm Course".

Only Selected Candidates will be intimated through E-mail by Course Coordinator. They have to remit the necessary course fee in the form of DD drawn in favor of "The Director, NIT Kurukshetra-136 119" payable at NIT- Kurukshetra.

The last date of registration is 20 November 2018.

## The Faculty



**Oleg KOZADEROV** is an Associate Professor and Deputy Head of the Physical Chemistry Department, Voronezh State University, Voronezh, Russia. He obtained his PhD in Electrochemistry (2005) and completed his professional thesis (Habilitation, 2016). He received the French Government Grant (2017), Presidential Grant for PhDs (2007), Grants of the Ministry of Education of Russia (2002, 2004). He was a co-recipient of the Grants of the Russian Foundation for Basic Research (2001, 2006, 2008). Prof. Kozaderov is an author of the manual for universities "Modern electrochemical power sources", monographs, and scientific papers in international peer-reviewed chemistry journals. He is a chairman of the Organizing Committee of the International Conference "Physico-chemical processes in condensed media and interphase boundaries". He was a visiting professor at National Chemical Engineering Institute in Paris, France (2016, 2017). His scientific research areas are electrochemical power sources, electrochemistry and corrosion of metals and alloys, and simulation of electrochemical processes.

## Course Co-ordinator



Dr. Chetti Prabhakar is an Assistant Professor at the Department of Chemistry, National Institute of Technology Kurukshetra, India. His research interests are in the areas of functional organic materials, electronic structure and properties of organic materials, computational design and synthesis of optoelectronic materials, Near Infrared (NIR) absorbing dyes and molecular docking.

## Course Co-ordinator Contact Address

**Dr. Chetti Prabhakar**  
**Assistant Professor**  
**Department of Chemistry**  
**NIT Kurukshetra**  
**PIN 136 119, India**  
**Email: [chetti@nitkk.ac.in](mailto:chetti@nitkk.ac.in)**

A Short Term Course on  
**ELECTROCHEMICAL ENERGY  
CONVERSION AND STORAGE**  
November 26-30, 2018  
Under  
Global Initiative of Academic Networks (GIAN), MHRD

**REGISTRATION FORM**

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Department: \_\_\_\_\_

Academic Degree: \_\_\_\_\_

Address for correspondence:  
\_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Category of participant:

- Faculty/Student/Research Scholar of NITKKR  
 Faculty/Student/Research Scholar of other Institute  
 Industry Participant  
 Foreign Participant

Accommodation required: Yes/No

**Payment Details:** \_\_\_\_\_

Amount \_\_\_\_\_

DD No. and Date \_\_\_\_\_

Payment Mode: DD for registration fee is in favor of the Director, NIT Kurukshetra payable at Kurukshetra.

- I agree to attend the course for the entire duration

Signature of applicant

Signature of sponsoring  
authority with Seal

**Lecture Notes**

To fully realize the objectives of the course, the lecture notes will be made available at the time of registration at NIT Kurukshetra

**Course Fees**

The participation fees for taking the course is as follows:

Participants from abroad : US \$ 100/-

Industry/Research Organization : Rs. 3000/-

Faculty Members / Researches : Rs. 1500/-

Students (pursuing Bachelors / Masters courses/Ph. D.) : Rs. 1000/-

The above fee includes all instructional materials and assignments, laboratory equipment usage charges.

**Payment Mode**

The registration fee has to be paid by DD drawn in favor of Director, NIT Kurukshetra, payable at SBI NIT Kurukshetra .

**Accommodation**

Subject to availability, the participants may be provided accommodation at the Institute Guest Houses/ hostels on payment basis depending on the availability. Please send request for accommodation in advance.

**Address for all Correspondence**

**Dr. Chetti Prabhakar**

Coordinator

Assistant Professor,

Department of Chemistry,

National Institute of Technology Kurukshetra,

Kurukshetra-136119

Haryana, India.

Mobile No: 9896119710

E-mail: chetti@nitkk.ac.in; chcprh@gmail.com