

Registration form

Link for registration:

<https://forms.gle/Qc13nGdg2ccc58ix6>

The details of the fee payment account is mentioned below:

Name – CONTINUING EDUCATION NIT ROURKELA

Acct. no. – 101 3895 1784

Bank – State Bank of India

Branch - NIT Rourkela Campus

IFS Code – SBIN0002109

Account type - Savings

SCAN and PAY:-

Merchant Name : CONTINUING EDUCATION NIT

UPI ID : 01389517841@sbi



Course venue – NIT Rourkela

The National Institute of Technology Rourkela (NIT Rourkela) was founded on August 15, 1961, by India's first Prime Minister, Jawaharlal Nehru. It was granted autonomy in 2002 as one of the NIT under the MHRD. NIT Rourkela provides graduate and post graduate degrees for 21 departments in Engineering, Science, Planning and Architecture, Management, and Humanities. The MHRD has recognized NIT Rourkela is ranked 13 (including IITs). The Times Higher Education World University Rankings 2018 placed NIT Rourkela 601-800 globally and 126 globally. The institute's 262-hectare campus is surrounded by beautiful hills, offering a stunning revitalizing setting suitable to study and research. The Institute's lush green campus accommodates all students, faculty, and staff. The campus provides everything a youth needs to build personal, social, and intellectual abilities.

Course Objectives

The course aims to:

- introduce the fundamental principles of electrochemistry in a clear and systematic manner;
- develop understanding of electrochemical potential, redox couples, and thermodynamics of electrochemical systems;
- introduce basic electroanalytical techniques and their appropriate use;
- enable participants to relate electrochemical concepts to scientific, research, and practical systems;
- provide practical exposure through live online demonstration of electrochemical instruments and experiments;
- motivate participants toward advanced learning and research in electrochemistry and electrochemical engineering.

Learning Outcomes

By the end of the course, the participants will be able to:

- Understand and apply electrochemical concepts to scientific, research and practical systems;
- Understand the role of electrochemical potential, redox couples, electrode processes, kinetics & transport in systems;
- identify and choose a suitable basic electrochemical technique for studying a reaction, system, or process;
- interpret electrochemical responses and experimental results in a scientifically meaningful manner;
- appreciate the role of electrochemistry in important engineering applications.

CONTACT

Dr. Adhidesh S. Kumawat

Coordinator

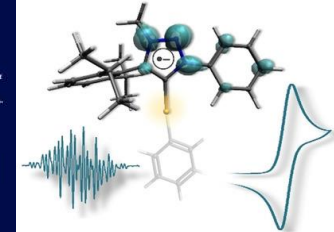
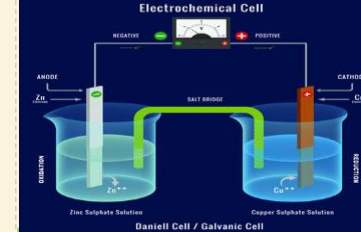
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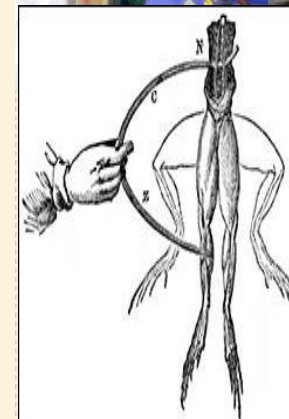
E-mail: kumawata@nitrkl.ac.in



4th Short term course
On

Electrochemistry – Fundamentals and Applications in Engineering (EFAE-26)

April 14 - 18, 2026



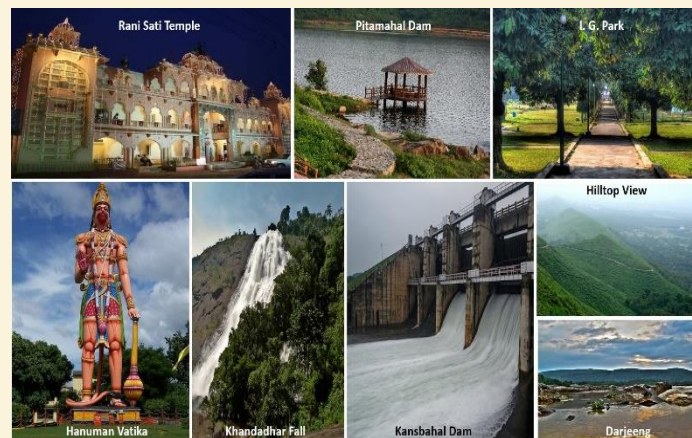
Organized by

Dept. of Chemical Engineering

National Institute of Technology Rourkela

Rourkela-769008

Odisha, India





Introduction to the course

Electrochemistry is one of the most important interdisciplinary areas connecting chemistry, materials science, energy systems, environment, and engineering practice. It forms the scientific basis of several modern technologies such as batteries, fuel cells, water electrolysis, corrosion control, electrochemical sensing, and electrosynthesis.

This short-term course is designed as a foundational course in electrochemistry for beginners, with emphasis on conceptual clarity, introduction to basic electroanalytical techniques, and selected engineering applications. The course is intended to help participants understand the essential principles governing electrochemical systems and to connect these principles with scientific, research, and practical engineering problems.

The program will cover basic concepts such as electrochemical potential, redox couples, cell thermodynamics, electrode kinetics, and common electrochemical techniques, along with illustrative application-focused discussions. The course will also include live online laboratory demonstration, live experiments, and real-time equipment-based sessions, enabling participants to observe electrochemical instrumentation and measurements in practice.

The course is expected to provide a strong conceptual base for students, researchers, and faculty interested in electrochemistry and related emerging technologies.



Course outline

Module – I	Foundations of Electrochemistry: → Introduction to electrochemistry and its engineering relevance → Basic electrochemical terminology → Electrochemical cells and their components → Electrochemical potential and cell voltage → Redox couples and equilibrium concepts → Reference electrodes and their practical significance
Application focus: Redox couples and reference electrodes	
Module – II	Electrochemical Thermodynamics and Kinetics: → electrochemical equilibrium, Nernst equation and its physical interpretation → Electrode reactions and overpotential → Introduction to electrode kinetics → Polarization behaviour and activation-controlled processes
Application focus: Hydrogen generation and fuel cells	
Module – III	Basic Electroanalytical Techniques: → Introduction to electrochemical measurement methods → Potentiometry and its applications → Voltammetric techniques: principle and interpretation → Chronoamperometric and transient methods → Selection of suitable technique for a given problem → Understanding and interpreting electrochemical response
Application focus: Water splitting and oxygen evolution	
Module – IV	Electrochemistry in Engineering Applications: → Electrochemistry in engineering systems → Basic electrochemical terminology → Electrochemical sensing and analytical applications → Energy and environmental applications of electrochemistry → Interpreting electrochemical data for real systems → Case studies linking fundamentals to practice
Application focus: Electrochemical sensing	
Module – V	Emerging Directions, Demonstration and Assessment: → Emerging directions in electrochemical engineering → Introductory perspective on electrochemical ammonia synthesis → Live online laboratory demonstration → Live experiments and equipment-based measurement sessions → Interactive discussion and doubt clearing
End-of-course test	

Who should attend?

- young researchers and faculties
- Electrochemist, bachelor-master-doctoral scholars of engineering and science disciplines
- Industry personnel and anyone involved in electrochemical applications.
- Facility owners and users who are concerned with electrochemical applications.

Successful participants who will attend the whole program will be given participation certificate.

Important Dates

Last date for receipt of application is 12th of April, 2026 and the notification of acceptance and program details will be shared by 13th April, 2026.

Registration Fees

Research Scholars : INR 300

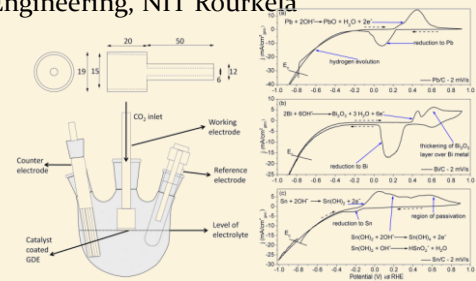
Faculties from institutes : INR 500

Industry delegates : INR 1000

- The course fee includes online course material.
- Participants (Faculty members and Ph.D. students) from NITRKL are exempted from paying registration fees.
- Participation certification would be provided to candidates successfully completing the course.

Resource Persons

Dr. Adhidesh S. Kumawat
 Assistant Professor, Dept. of Chemical Engineering, NIT Rourkela



Industrial partner:
Conductive Creations Pvt Ltd
conductivecreations.com