



CSIR– NIIST



Integrated Skill Initiative

Mode of Training:
Offline

Schedule:
January 16-23, 2023

Duration: 7 days

No. of Seats: 10-20

Course Coordinator
Dr. Sreejith Shankar

Course Fees:
Students: Rs.10,000/-
Sponsored*: Rs.15,000/-

Apply online:
<http://sdp.niist.res.in>

Payment through
Bank Transfer

The Director, CSIR-NIIST
(Regional Research Laboratory)
Account No: 67047723825
IFSC Code: SBIN0070030
Bank : State Bank of India,
Pappanamcode Industrial Estate

*candidates sponsored by industries/ research organization/ colleges

Electrochemistry– Fundamentals, Advanced Techniques and Applications

Objectives and Scope

Redox chemistry that involves the transfer of electrons is the working principle behind all electrochemical processes. Electrochemistry has evolved from a branch of science that provides fundamental aspects of redox chemistry for understanding cell functions and transmission of signals through the nervous system to a realm of high-end technologies including renewable energy and rechargeable batteries for electric vehicles. Knowledge of electrochemistry is indispensable for materials production of via electrorefining or electrodeposition and materials destruction via corrosion, as well as for understanding metallurgical transformations and water purification. Electrochemistry also provides a multi-utility tool kit for the development of sensors, smart devices and wearable/flexible electronics. With the advent of e-vehicles, working knowledge of electrochemistry is a handy expertise towards job opportunities in the development of batteries, fuel cells, supercapacitors, smart devices and windows, etc. This program is designed to provide attendees with a working knowledge of electrochemistry, its fundamental aspects, advanced techniques and emerging applications, including hands-on training sessions on different electrochemical modules.

Topics to be covered:

1. Introduction to electrochemistry
2. Redox Reactions
3. Basic Theories in electrochemistry, Modern theories of electrolyte solutions
4. Potentiostatic and galvanostatic methods
5. Kinetics, mass and electron transfer processes, electrochemical rate constants and methods for estimation, mass transport processes
6. Electrochemical double layer
7. Solid state electrochemistry, surface confined electrochemical processes, electro-polymerization, electrocatalysis .
8. Electrochemical processes
9. Nanostructured and surface modified electrodes
10. Electrochemical energy storage systems
11. Green electrochemistry
12. Practical applications of electrochemistry
13. Experimental electrochemistry

Eligibility

Bachelors, Masters or PhD Degree in Science or Engineering

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