



# ELECTROCHEMICAL TECHNIQUES POWERING FUTURE BATTERY, ENERGY STORAGE, CONVERSION AND MONITORING REACTIONS

**@ IISER- TIRUPATI**

**(5-DAY HANDS-ON TRAINING PROGRAM)**



**ORGANIZED BY**



**DEPARTMENT OF CHEMISTRY**

**DATE : (MARCH 09-13,2026)**

## ABOUT INSTITUTE

IISER Tirupati is a premier institute excelling in science education and research across departments including Chemistry, Physics, Mathematics, Biology, Earth Sciences, and Humanities & Social Sciences. It offers rigorous BS-MS, MS, iPhD, PhD, and research programs focused on both fundamental and applied sciences.

The institute conducts advanced research in sustainable chemistry, energy materials, catalysis, quantum physics, computational biology, disease biology, and environmental sciences. With state-of-the-art instrumentation facilities and a collaborative environment, IISER Tirupati empowers students and faculty to drive innovation. Its mission is to foster scientific curiosity, nurture talent, and contribute to India's scientific and technological advancement through excellence and knowledge dissemination.

## ABOUT DEPARTMENT

The Department of Chemistry at IISER Tirupati fosters a spirit of academic excellence and innovation through its committed and vibrant faculty members, who are actively contributed to inter-disciplinary research verticals across chemical sciences. Chemistry department is dedicated to advancing several key areas of cutting-edge research such as sustainable chemistry, green energy, advanced/smart materials (2D hybrids, quantum dots, perovskites, chiral, and magnetic materials, electrodes for batteries), machine learning/AI, and diagnostic tools, all in alignment with our national missions. We are committed to achieving carbon neutrality, hydrogen generation from biomass derivatives, and recycling lithium batteries as part of the circular economy to create a better future.

Department of Chemistry also explores the interface of chemistry and biology, developing innovative analytical tools for disease diagnosis and therapeutics. We emphasize fundamental sciences, including chemical biology, biometric chemistry, supramolecular chemistry, astrochemistry, natural product synthesis, electrochemistry, and the mechanistic understanding of biological systems using advanced experimental and computational tools. Major research efforts are devoted for the development of robust and selective catalytic systems for synthesizing new materials, APIs/KSMs, and life science molecules. Additionally, our theoretical chemistry team provides detailed insights into the functions of diverse molecular and extended systems.



## ABOUT THE PROGRAM

This five-day comprehensive hands-on program is designed to introduce participants to modern electrochemical techniques that drive next-generation energy technologies. From batteries, supercapacitors, and fuel cells to electrocatalysis and green hydrogen, the program emphasises how electrochemical tools enable efficient energy storage and conversion. Participants will also gain hands-on experience with electrochemical methods for real-time monitoring of reactions, bridging fundamental concepts with practical applications across research, industry, and sustainability.

## OBJECTIVES & SCOPE

This Skill Development Program aims to provide participants with strong theoretical knowledge and hands-on training in modern electrochemical techniques for energy storage, energy conversion, and reaction monitoring. The program focuses on core principles and key tools such as cyclic voltammetry and impedance spectroscopy, with applications in batteries, fuel cells, electrocatalysis, and green hydrogen technologies, thereby enhancing research readiness and industry-relevant skills in sustainable energy systems.

## SALIENT FEATURES OF THE PROGRAM

- Coverage of fundamental to advanced electrochemical concepts for energy storage and conversion
- Hands-on training in key techniques such as cyclic voltammetry, impedance spectroscopy, and chrono-methods
- Application-focused modules on batteries, supercapacitors, fuel cells, electrocatalysis, and green hydrogen
- Training in electrochemical tools for real-time reaction monitoring and analysis
- Exposure to modern instrumentation, data acquisition, and result interpretation
- Interactive expert sessions bridging theory and practical challenges
- Skill-oriented curriculum enhancing research capability and industry readiness

## REGISTRATION FEES

- INR 5000/- for BSc/MSc Students (Internal)
- INR 6000/- for BSc/MSc Students (External)
- INR 7500/- for PhD Students/ IPhD Students
- INR 10,000/- for post-docs and faculties
- INR 12,500/- for Industry Associates

**Note:** Registration fees do not include food and accommodation. Accommodation will be arranged on a payment basis, subject to availability.



## INSTRUMENTS COVERED FOR TRAINING:



### Cyclic Voltammetry (CV)

Model: Biologic SP200

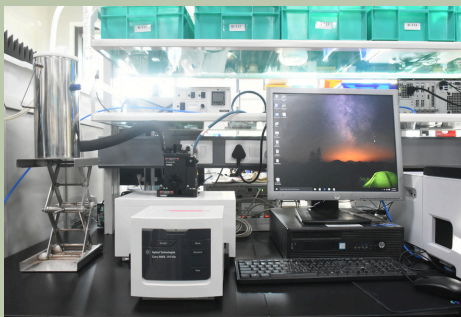
The BioLogic SP-200 electrochemical workstation is used for performing cyclic voltammetry (CV) to study the redox behavior, kinetics, and electrochemical properties of materials. It precisely controls the applied potential and measures the resulting current response, enabling detailed analysis of electrochemical reactions. The SP-200 offers high accuracy, stability, and reproducibility, making it suitable for applications in batteries, supercapacitors, electrocatalysis, corrosion studies, and energy conversion research.



### Gas Chromatography (GC)

Model: Agilent 8860C

The Agilent 8860C GC system separates and analyzes volatile and semi-volatile compounds by passing a vaporized sample through a capillary column using an inert carrier gas. It features a temperature range of Ambient +4 °C to 450 °C, supports FID & TCD, and uses Electronic Pneumatic Control (EPC) for precise operation. The system ensures high accuracy and reliability for environmental, petrochemical, and pharmaceutical analyses.



### Carry Ultraviolet-visible spectroscopy (UV-Vis)

Model: Agilent carry 8454

The Agilent Cary 8454 UV-Visible spectrophotometer is a diode-array system used for rapid and accurate absorbance measurements in the ultraviolet and visible regions. It operates over a wavelength range of 190–1100 nm and allows simultaneous multi-wavelength data acquisition with good photometric accuracy. The instrument supports spectral scanning, kinetic measurements, and quantitative analysis, making it suitable for pharmaceutical, environmental, biochemical, and industrial applications. Its stable optical design ensures reliable and reproducible results.

### BATTERY CYCLER

MODEL:BIOLOGIC BCS-805,810 (64 CHANNELS)

### INSTRUCTORS



PROF VIJAY M PILLAI



DR. E. BALARAMAN



DR ARAVINDAN V



DR. PANKAJ KOLI



DR SOUMIT S MONDAL



DR. KIRAN P

### ELIGIBILITY CRITERIA

Open to students, researchers, faculty members, and scientific or academic professional

### GENERAL INFORMATION

- Certificates will be awarded to participants upon successful completion of the program.
- The registration fee is non-refundable under any circumstances.
- On-campus accommodation and food will be available on a payable basis, subject to availability.
- All program-related information and updates will be communicated to registered participants via email.

### HOW TO REACH IISER TIRUPATI CAMPUS

Air: Tirupati Airport (~16 km)

Train: Renigunta Junction (~20 km) or Tirupati Station (~30 km)

Road: Accessible via NH716; taxis and buses available from Renigunta and Tirupati.

### REGISTRATION

Participants are required to apply for the training program by scanning the QR code provided below and filling out the application in the Google form.



The application deadline is March 1<sup>st</sup>, 2026.

### CONTACT DETAILS



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chemistry-office@labs.iisertirupati.ac.in

### VENUE

Department Of Chemistry, IISER-Tirupati



<https://www.iisertirupati.ac.in/departments/chemistry/>  
<https://www.iisertirupati.ac.in/research-facilities/>