



# ELECTROCHEMICAL TECHNOLOGY IN POLLUTION CONTROL

**PROF. J. R. MUDAKAVI**

Department of Chemical Engineering  
IISc Bangalore

**TYPE OF COURSE** : Rerun | Elective | UG/PG

**COURSE DURATION** : 8 weeks (24 Jan' 22 - 18 Mar' 22)

**EXAM DATE** : 27 Mar 2022

**PRE-REQUISITES** : 10 +2 + 3 years of BE / BSc Basic knowledge of differential calculus and integration

**INTENDED AUDIENCE** : Chemists and Chemical Engineers, Environmental Engineers, Environmental Scientists, Civil Engineers, Pollution Control Administrators, B.Sc, M.Sc and PhD students.

**INDUSTRIES APPLICABLE TO** : Chemical industries, Pollution Control

**COURSE OUTLINE :**

Electroanalytical techniques have assumed great importance in pollution monitoring of chemical species in the last 20 years. Electrochemical sensors including ion selective electrodes are employed to detect the pollution levels in all public spaces. They also find extensive applications in medical diagnosis, industrial process monitoring, communication industry etc. Fuel cells and battery technology are the energy sources of the future. Industrial wastes generated from electrochemical processes are one of the most hazardous wastes which need to be effectively managed. The course aims to introduce the fundamental principles of electrochemistry for routine and non-routine analysis, electrochemical processes used in the industry, battery and fuel cell technologies and recent advances in hazardous electrochemical waste management including concepts of zero liquid discharge.

**ABOUT INSTRUCTOR :**

Prof. J.R Mudakavi is a former faculty of Chemical Engineering Department in Indian Institute of Science, Bangalore. He has taught "Modern Instrumental Methods of analysis and Pollution Control" for 36 years. He is the author of 2 books on Air Pollution and Hazardous Waste management. He has published more than 100 papers in National and International Journals, conferences, Symposia etc. He is a member of several expert committees such as CSIR, DST, MOEF, KSPCB etc., He is a popular science writer and lecturer and environmentalist.

**COURSE PLAN :**

**Week 1:** Atomic and Molecular structure

**Week 2:** Properties of solutions

**Week 3:** Electrochemical methods-1

**Week 4:** Electrochemical methods-2

**Week 5:** Electrochemical methods-3

**Week 6:** Ion selective electrodes and Electrochemical sensors

**Week 7:** Process waste handling and Electroplating

**Week 8:** Batteries and fuel cells and ZLD