1.	Title of the course	Electrochemistry and Chemistry of Solids
2.	Course number	CY601L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CY6101/10
6.	To be offered by	Department of Chemistry
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To provide a thorough background in electrochemistry and solid-state chemistry that imparts knowledge on advanced materials for energy applications. Several applications in solutions, surfaces and in solids will also be covered in detail.	
10.	**Course Content:** Electrode potentials; Electrochemical cells and thermodynamics; Kinetics of electrode processes; Mass transport; Double layers: zeta and overpotential, Faradaic and Non-Faradaic processes; Laplace transforms and microelectrodes; Homogeneous and heterogeneous reactions; Conductivity and Conductance; Different potential scan techniques including cyclic voltammetry; Spectrochemical and photo-electrochemical methods; Industrial electrochemistry: electrodes as sensors; Concept of Solids: unit cell, lattice and basis, Bravais lattices; Symmetry: Schonies and Hermann-Mauguin notations, point and space groups; Defects and voids; Lattice planes, Miller indices, X-ray diffraction: Bragg's law; Introduction to single-crystal and powder X-ray, electron-density maps, electron microscopy; Crystal structures of elements and compounds; Band structure: electrical conductivity, optical properties.	
11.	**Textbook(s):** 1. Bard A J and Faulkner L R, *Electrochemical Methods: Fundamentals and Applications*, Willey (2001). 2. West A R, *Solid State Chemistry and its Applications*, Willey (2014).	
12.	**Reference(s):** 1. Ashcroft N W and Mermin N D, *Solid State Physics*, Harcourt (1976). 2. Bockris J, Reddy A K N and Gamboa-Aldeco M E, *Modern Electrochemistry*, Springer US (2000). 3. Kittel C, *Introduction to Solid State Physics*, John Willey and Sons (2012). 4. Skoog D A, Crouch S R and Holler F J, *Principles of Instrumental Analysis*, Thomson Brooks/Cole (2006).	