Indian Institute of Technology, Kanpur

Department of Chemistry

Course Title	Electron, Proton and Hydride
Course No.:	CHM663
Credits:	3-0-0-0 (9)

Course Contents

S. No.	Topics	No. of lectures
1	**Electrons:**	
	Electron transfer – Chemical and Electrochemical; Chemistry of reducing and oxidizing agents; analytical methods in working with electrons – basic electrochemistry and methods;	6
2	**Protons:**	
	Proton management; keto-enol, lactam-lactim, amide-imide, amine-imine tautomerism in catalysis; special acids in studying the mechanism, analytical methods	6
3	**Hydrides:**	
	Metal hydrides: Synthesis, stability, thermodynamics, how hydridic is the hydride - hydridicity, analytical methods in working with hydride	6
	Organic hydrides and their stoichiometric and catalytic reactions; regeneration	4
	Covalent hydrides, Prohydrides, Ammonia-Borane, Masked hydrides	4
	Hydrides in biology	2
	PCET	3
4	Electron, proton and hydride in small molecule activation	5
5	Electrocatalysis - homogeneous and heterogeneous; aqueous and non-aqueous; advantages and challenges	5
6	Hydrogen - advantages and challenges	1