Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NCYD518	Metalloenzymes-Special Topics	3	0	0	3

Course Objective

- The course is intended to impart basic understanding about the structure and function of metal containing enzymes and its model

Learning Outcomes

At the end of the course the student is able to-

- Know the difference in the structure and function of various metalloenzymes
- Develop understanding about the role of metal ions and the mechanism of action
- Understand the design aspects of metalloenzyme model compounds

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction to metalloenzymes: Coordination chemistry and basic characterization techniques, suggested mechanism of selected enzymes and synthetic analogues	12L	Students will learn to differentiate metallo-enzymes from other metal-active catalysts.
2	Vanadium: haloperoxidases; Cobalt: cobalamine based enzymes; Zinc: hydrolases, peptidases, ligases, transferases, lyases, oxido-reductases; Iron: heme and non-heme enzymes-Phosphatases, Mono oxygenases, dioxygenases, peroxidase, catalase, super-oxide dismutase, Hydrogenases: Fe-Fe and Fe-Ni hydrogenases, Reductases: Methyl coenzyme M reductase	16L	Able to understand the chemistry of the active site iron, vanadium and zinc in enzymatic function.
3	Manganese: Oxygen Evolving Complex in PS-II, super-oxide dismutase, catalase; Arginase, Copper: Mono oxygenases, dioxygenases, super-oxide dismutase, catecholase and tyrosinase; Galactose oxidase, Nickel: urease, hydrogenase, super-oxide dismutase, Coenzyme F-430; Molybdenum: Oxido-reductases.	14L	Develop better understanding of the chemistry of manganese, copper, nickel and molybdenum in metalloenzymes.
TOTAL		**42**	

Text Books:

1. Bio-inorganic chemistry by I. Bertini, H. B. Gray, S J Lippard, J. S. Valentine – Viva Books 1998
2. Biological Inorganic Chemistry: Structure and reactivity by I. Bertini, H. B. Gray, E. I. Stiefel, J. S. Valentine, 2007, University Science Books

Reference Books:

1. Bio-inorganic chemistry- A survey by Ei-ichiroOchiai, 2006, Associated Press, Elsevier
2. Chemical Reviews 1996, Vol. 96 and other recent literature on specific enzymes.