

Title: Molecular Enzymology [2-1-0-3]**Pre-requisites, if any:** BB101 or equivalent knowledge in biology**Content** (*List of the topics/sub-topics to be covered in the lectures/practicals/assignments*):

Concept of efficient catalysis and historical perspective on enzymes; Enzyme nomenclature; Origins of enzyme catalytic power; Kinetic approaches to understand enzyme action; Michaelis-Menten kinetics; Evaluation of K_m , k_{cat} and enzyme inhibition analysis; Elucidation of kinetic mechanism through initial velocity, product inhibition, pH and isotopic analysis; Role of metal ions in enzyme catalysis; Allosteric regulation in enzymes.

Structural basis of enzyme action and characterization of active site residues; Integration structural data to describe enzyme action; Frontiers in enzymology: Design of efficient and functionally diverse enzymes, directed evolution, abzymes, non-protein catalysts (artificial enzymes).

Applied enzymology and enzyme technology.

Texts / References

- ENZYMES: Catalysis, Kinetics and Mechanisms by N. S. Punekar, Springer; 2018
- Enzymatic reaction mechanisms by C. Walsh. WH Freeman, San Francisco, 1979.
- Enzyme Kinetics and Mechanism by Paul F. Cook and W. Wallace Cleland, Garland Science, 2012
- Enzyme Kinetics by I. Segel. Wiley Interscience, NewYork, 1993.
- An introduction to enzyme and coenzyme chemistry by T. Bugg 2nd Ed., Blackwell Publishers, Oxford, 2004.
- Enzyme Kinetics: Principles and Methods by H. Bisswanger Translated by L. Bubenheim. Wiley-VCH Verlag GmbH, Weinheim, Germany, 2002.
- Fundamentals of Enzyme Kinetics by A. Cornish-Bowden 3rd Edition, Portland Press, London, 2004.