

Indian Institute of Technology Guwahati
Proposal for a New Course / Revision of a Course

Course Number & Title: BT 604 & Enzymology	
L-T-P-C: 3-0-0-6	
Type of Letter Grading (Regular Letter Grades / PP or NP Letter Grades): Regular Letter Grades	
Kind of Proposal (New Course / Revision of Existing Course): Revision of existing course	
Offered as (Compulsory / Elective): Electives	
Offered to: B Tech/M Tech/PhD	
Offered in (Odd/ Even / Any): Any	
Offered by (Name of Department/ Center): BSBE	
Pre-Requisite: Nil	
Preamble / Objectives (Optional): Enzymology is a branch of biology which deals with chemistry, biochemistry and effects of enzymes, their kinetics, structure and function as well as their relation with each other. Enzymes are mostly proteins which catalyze specific metabolic reactions and are synthesized in cells for addressing different functions.	
<p>Course Content/ Syllabus</p> <p>Basic concepts of enzyme: introduction and chemical nature of enzymes, naming and classification of enzymes, specificity of enzyme action, monomeric and oligomeric enzymes, chemical nature of enzyme catalysis; Enzyme kinetics: derivation of Michaelis-Menten equation for single substrate enzyme and concept of K_m and V_{max}, and Enzyme turnover number (K_{cat}), kinetics of zero & first order reactions, type of inhibitors and their effects on the enzyme catalyzed reaction, Exposure to multi substrate enzymes catalyzed reactions; Enzyme Regulation: General mechanisms of enzyme regulation, sigmoidal and allosteric enzymes, Hill and Scatchard plots, positive and negative co-operativity with suitable examples (like aspartate transcarbamoylase & phosphofructokinase); Applied Enzymology: Applications of enzymology; structure and function of enzymes; Enzyme engineering with suitable examples.</p>	
Books (In case UG compulsory courses, please give it as "Text books" and "Reference books". Otherwise give it as "References".	
Texts book and references: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	Irwin H. Segel, Biochemical Calculations: How to Solve Mathematical Problems in General Biochemistry 2nd Ed., Wiley India Pvt. Ltd, 2010.
2.	T. Palmer (Ed), Enzymes: Biochemistry, Biotechnology, Clinical Chemistry, 2nd Ed., Horwood Publishing Chichester, 2007 .
3.	J. L. Tymoczko, J. M. Berg and L. Stryer, Biochemistry, 8th Ed., W. H. Freeman, 2015.
4.	Selected articles from journals like Journal of Biological Chemistry, Enzymes and Microbial Technology, Molecular Catalysis, Enzymology etc. and review articles appeared in journals, books and series