University of Management & Technology
School of Science
Department of Life Sciences

BT-306 Enzymology

Lecture Schedule		**Semester**	Spring 2021
Pre-requisite	---	**Credit Hours**	3
Instructor	Dr. Asma Irshad	**Contact Moodle link**	Asma.irshad@umt.edu.pk
Office	Additional Offices	**Office Hours**	See office window

Course Description	An important feature of biotechnology is the use of enzymes and microorganisms to manufacture products useful to society. These products range from industrial alcohol, food additives and other bulk products, to antibiotics and recombinant therapeutic proteins. In this course, the important aspects of enzymes will be discussed especially related to their use in industry and health. The technologies used in separation of these entities are included in this course. Enzyme kinetics and inhibition will be dealt in detail to elucidate the mechanism of enzyme catalyzed reactions.
Expected Outcomes	Students will obtain basic knowledge about the relationship between properties and structure of the enzymes, their mechanism of action and kinetics of enzymatic reactions. They should be able to characterize the enzymes in each enzymatic class, examples of such enzymes and their application in practice. They should understand the regulatory mechanisms of enzyme activity, enzyme inducers and represors. In the second part of the lectures will acquire they have knowledge in the field of biosensors and immobilized systems. At the end of the course will be presented use of enzymes in medicine, food, organic synthesis, genetics and other areas sectors.
Textbook(s)	1. Lehninger Principles of Biochemistry, by David L. Nelson and Michael M. Cox, 6th Edition, Macmillan International Edition. 2. Enzymes: A Practical Introduction to Structure, Mechanism, and Data Analysis. By Robert A. Copeland 3rd Edition. 3. Biochemistry, by Biochemistry. Jeremy M. Berg, John L. Tymoczko, Lubert Strye, 7th Edition, Palgrave MacMillan.
Grading Policy	• Quizzes: 15% • Assignment 10% • Presentation 10% • Midterm: 25-30% • Final Exam: 40-50%

Course Schedule

Week	Lecture #	TOPICS
1	1 2	Introduction to Enzymes Protein structure
2	1 2	Motif and Domains Denaturation and Folding of Proteins
3	1 2	Classes of Enzymes Mechanism of enzyme catalyzed reactions
4	1 2	How enzymes works Induce Fit hypothesis
5	1 2	Chymotrypsin Enolase
6	1 2	Isolation and Purification of enzymes-I Isolation and Purification of enzymes-II
7	1 2	Separation Techniques-I Separation Techniques-II
8	1 2	Separation Techniques-III Separation Techniques-IV
9	1 2	Midterm Exam Electrophoresis-Separation and determination
10	1 2	Enzyme Assays-I Enzyme Assays-II
11	1 2	Enzyme Kinetics: steady and Pre-steady state Michaelis Menten Equation
12	1 2	Substrate recognition and Kinetics Inhibition
13	1 2	Allosteric Enzymes Ribozymes
14	1 2	Microbial Enzymes Enzymes In industry
15	1 2	Enzymes in Health Recent Trends in enzymology