

VANITA VISHRAM WOMEN'S UNIVERSITY

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BIOTECHNOLOGY



**VANITA VISHRAM
WOMEN'S UNIVERSITY**

SURAT

**BACHELOR OF SCIENCE (B.Sc.) HONOURS IN
BIOTECHNOLOGY**

**Under Learning Outcomes Based Curriculum Framework
(LOCF)**

For Undergraduate (UG) Education

SEMESTER - 3

Skill Enhancement Course (SEC)

**Syllabus applicable to the students seeking admission in the
following Program**

B.Sc. Biotechnology under LOCF w.e.f. the Academic Year

2021-2022

BACHELOR OF SCIENCE (B.SC.) BIOTECHNOLOGY HONOURS

SEMESTER 3

CORE COURSE PAPER 1

ENZYMOLGY

Course Objectives:

- Enzymology is a requisite discipline which plays central role for many, such as biochemistry, genetic engineering, industrial biotechnology, clinical diagnostics as it is regulating all metabolic reactions, central dogmas of biology.
- Enzymology has so many applications in diverse areas like industries, genetic manipulation to get better life, forensic science which make it a favorite area of scientific exploration.

Course Outcome:

- Introduction to enzymes, their working and kinetics.
- Regulation of Enzyme activity.
- Strategies for extraction and purification of enzymes.
- Applications of enzymes.

BT15010 - THEORY COURSE CONTENT**(4 Credits)**

UNIT 1	Enzymes History Chemical nature and properties of enzymes: Holoenzyme, apoenzyme, Cofactors, coenzyme, prosthetic groups, metalloenzymes, monomeric & oligomeric enzymes, zymogen or proenzyme Enzyme specificity Nomenclature and classification of Enzymes. Working of enzymes: Activation energy and transition state, enzyme activity, specific activity, Active site (common features of active sites) Mechanism of enzyme action: Enzyme kinetics: Michaelis-Menten equation and its derivation; Different plots for the determination of K_m and V_{max} and their physiological significance Factors affecting Enzyme Activity	17 lectures
UNIT 2	Regulation of Enzyme Activity Enzyme inhibition: types of inhibition, suicide inhibitor. Non protein enzymes Isoenzymes, Allosteric enzyme Enzyme inhibition Units of enzyme activity	17 lectures
UNIT 3	Extraction and Purification of Enzymes Factors affecting isolation of enzyme/ source selection of enzyme Sources for enzyme production Extraction of soluble, membrane bound enzymes Purification of enzymes: preliminary and advanced methods	14 lectures

UNIT 4	<p>Applications of enzyme</p> <p>Clinical significance of enzymes/biological roles of enzymes</p> <p>Application of enzymes in medicine, forensic science and food industry</p> <p>Enzyme immobilization</p> <p>Biosensors</p>	<p>12</p> <p>lectures</p>
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SUGGESTED READING

1. Biochemistry, Lubert Stryer, 6th Edition, WH Freeman, 2006.
2. Harper's illustrated Biochemistry by Robert K. Murray, David A Bender, Kathleen M.Botham, Peter J. Kennelly, Victor W. Rodwell, P. Anthony Weil. 28th Edition, McGrawHill, 2009.
3. Biochemistry, Donald Voet and Judith Voet, 2nd Edition, Publisher: John Wiley andSons, 1995.
4. Biochemistry by Mary K.Campbell & Shawn O.Farrell, 5th Edition, Cenage Learning,2005.
5. Fundamentals of Enzymology Nicholas Price and Lewis Stevens Oxford University Press 1999
6. Fundamentals of Enzyme Kinetics Athel Cornish-Bowden Portland Press 2004
7. Practical Enzymology Hans Bisswanger Wiley–VCH 2004
8. The Organic Chemistry of Enzyme-catalyzed Reactions Richard B. Silverman Academic Press 2002

