

**BHARATHIAR UNIVERSITY (CBCS PATTERN)**  
**B. Sc. BIOCHEMISTRY DEGREE COURSE**  
**SCHEME OF EXAMINATION - CBCS PATTERN**

**For the students admitted during the academic year 2010 – 2011 batch and onwards**

Part	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.Hrs	CIA	Marks	Total Marks	
	<b>Semester I</b>							
I	Language – I		6	3	25	75	100	4
II	English – I		6	3	25	75	100	4
III	Core Paper I - Biomolecules		3	3	25	75	100	4
	Core Paper II - Cell Biology		3	3	25	75	100	4
	Core Biochemistry Practical – I		2	-	-	-	-	-
	Allied A : Paper I – Chemistry		6	3	20	55	75	4
	Allied Chemistry Practicals		2	3	-	-	-	-
IV	Environmental Studies #		2	3	-	50	50	2
	<b>Semester II</b>							
I	Language – II		6	3	25	75	100	4
II	English – II		6	3	25	75	100	4
III	Core Paper III - Biomedical Instrumentations		5	3	25	75	100	4
	Core Biochemistry Practical – I		3	3	40	60	100	4
	Allied A : Paper II - Chemistry		6	3	20	55	75	3
	Allied Practical – Chemistry		2	3	20	30	50	2
IV	Value Education – Human Rights #		2	3	-	50	50	2
	<b>Semester III</b>							
I	Language – III		6	3	25	75	100	4
II	English – III		6	3	25	75	100	4
III	Core Paper IV - Enzyme and Enzyme Technology		3	3	25	75	100	4
	Core Paper V – Microbiology		3	3	25	75	100	4
	Core Biochemistry Practical - II		2	-	-	-	-	-
	Allied B: Paper I – Basic Mathematics		6	3	20	55	75	3
IV	Skill based Subject I - Bioinformatics		2	3	20	55	75	3
	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women’s Rights#		2	3	50		50	2

<b>Semester IV</b>							
I	Language – IV	6	3	25	75	100	4
II	English – IV	6	3	25	75	100	4
III	Core Paper IV – Intermediary Metabolism	4	3	25	75	100	4
	Core Biochemistry Practical – II	3	6	30	45	75	3
	Allied B : Paper II – Computer	4	3	20	55	75	3
	Practical – Computer	2	3	20	30	50	2
IV	Skill based Subject 2 - Basics of Information Technology	3	3	20	55	75	3
	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	50		50	2
<b>Semester V</b>							
III	Core Paper VII – Human Physiology	4	3	25	75	100	4
	Core Paper VIII – Clinical Biochemistry	4	3	25	75	100	4
	Core Paper IX – Molecular Biology	4	3	25	75	100	4
	Core Paper X – Genetic Engineering and Bioprocess Technology	3	3	25	75	100	4
	Biochemistry Practical – III	4	-	-	-	-	-
	Biochemistry Practical - IV	4	-	-	-	-	-
	Elective – I	4	3	20	55	75	3
IV	Skill based Subject 3 - Genomics and Proteomics	3	3	20	55	75	3
<b>Semester VI</b>							
III	Core Paper XI – Plant Biochemistry and Plant Therapeutics	4	3	25	75	100	4
	Core Paper XII – Medicinal Chemistry	4	3	25	75	100	4
	Biochemistry Practical – III	4	6	30	45	75	3
	Biochemistry Practical – IV	4	6	30	45	75	3
	Elective – II	4	3	20	55	75	3
	Elective – III	4	3	20	55	75	3
IV	Skill Based Subject 4 - Practical – I & II	6	6	30	45	75	3
V	Extension Activities @	-	-	50	-	50	2
	Total					3500	140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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<b>List of Elective papers (Colleges can choose any one of the papers as electives)</b>		
Elective - I	A	Immunology and Immunotechniques
	B	Introduction to Biomaterials
	C	Nutritional Biochemistry
Elective - II	A	Plant and Animal Biotechnology
	B	Nanomaterials and Nanomedicine
	C	Health and Hygiene
Elective - III	A	Diagnostic Biochemistry
	B	Sports Biochemistry
	C	Nanobiotechnology

Note :

1. The syllabus for the above papers (**except Core paper IV – Enzyme and Enzyme Technology**) be the same as prescribed for the academic year 2008-09.
2. The syllabus for the **Core paper IV – Enzyme and Enzyme Technology** are furnished below.

## SEMESTR – III

### **SUBJECT TITLE: ENZYME AND ENZYME TECHNOLOGY** (for B.Sc. Bio-Chemistry 2010-11 & B.Sc. Bio-Chem. With Nanotech. 2010-11)

#### **SUBJECT DESCRIPTION:**

Enzymes are protein catalyst that regulates the rates at which physiological process takes place. Consequently defects in enzyme function frequently cause diseases. Hence, sound knowledge about enzymes is essential for life science students.

**GOALS:** To enable the students to learn about the different types of enzymes and its isolation and purification which will pave the ways in which the students can enter in research field.

#### **OBJECTIVES:**

- On successful completion of the course the students will acquire knowledge about
- ❖ Techniques of isolation & purification of the enzymes.
  - ❖ Kinetics of the enzymes
  - ❖ Enzymes that are used in medicine and industry

#### **CONTENTS:**

##### **UNIT – I**

**Enzymes:** Introduction, Definition, International Classification of enzymes, Numbering and nomenclature. Enzyme units.

Definition of active sites. Theories proposed – Lock and Key or template model and induced fit model, ordered and random binding of substrate. Enzyme specificity – Group specificity, optical specificity.

Enzyme as proteins Structure: Primary, Secondary, Tertiary and Quaternary structure with reference to examples.

##### **UNIT – II**

###### **Enzyme kinetics and enzyme inhibitors:**

Enzyme Kinetics: Derivation of Michaelis-Menten's equation, transformation of MM equation, Line-Weaver Burk plot and Eadie-Hofstee plot. Effect of pH, Temperature, enzyme activity, turn over number of enzymes.

Enzyme Inhibition: Competitive, non-competitive and un-competitive inhibition.

Regulatory enzymes, allosteric enzymes with reference to aspartate transcarbamoylase, covalently modulated enzymes and Isoenzymes. Ribozymes, Abzymes.

##### **UNIT – III**

**Coenzymes:** Definition, Structure and functions of TPP, NAD, NADP, FAD, FMN, Coenzyme A, Metal cofactors.

Multienzyme Complex: Pyruvate dehydrogenase.

Mechanism of enzyme action: General acid base catalysis, covalent catalysis, Proximity orientation. Mechanism of action of Lysozyme and chymotrypsin.

Measurement of enzymatic reactions: Spectrophotometry and radio assay.

#### **UNIT – IV**

**Enzyme Technology:** Immobilized enzymes: Source and techniques of immobilization. Effect of immobilization on enzyme activity. Application of immobilized enzymes. Industrial Production of enzymes: Amylase, Proteases, Pectinases. Industrial uses of enzymes.

#### **UNIT –V**

Uses of Enzymes in analysis: Enzymes as Biosensors – Calorimetric biosensors, Potentiometric biosensors, Amperometric biosensors, Optical biosensors and immunosensors. It's Principle, technique, mechanism and examples.

**Enzyme engineering:** Artificial enzymes. Enzymes used in diagnosis and various diseases with normal and abnormal values. Antioxidant enzymes.

#### **REFERENCES:**

1. Trevor Palmer, 3<sup>rd</sup> edition, 1991. Understanding enzymes. Ellis-Horwood Limited.
2. Enzymes – Dixon and Webb.
3. Enzyme Technology – Chapline & Bucke.
4. Alan Welshman, 2<sup>nd</sup> edition, Hand book of enzyme biotechnology.