



# SACRED HEART COLLEGE (AUTONOMOUS)

Tirupattur – 635 601, Tamil Nadu, S.India

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A Don Bosco Institution of Higher Education, Founded in 1951 \* Affiliated to Thiruvalluvar University, Vellore \* Autonomous since 1987

Accredited by NAAC (4<sup>th</sup> Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Sacred Heart College (Autonomous), Tirupattur District

1.2.1 List of New Courses

## B. Sc. Biochemistry

SEM	Sub Code	Title of the Subject	Hours	Credit	E-Hrs	CA	SE	Total
I SEMESTER	LT114	Tamil-I	5	3	3	50	50	100
	LE115AT	English-I	5	2	3	50	50	100
	LE115AP	English Lab-I	-	1	-	-	-	-
	BC106	Cell Biology	3	3	3	50	50	100
	BC107	Biomolecules	4	4	3	50	50	100
	PBC102	Main practical- I	3	3	3	50	50	100
	ACH110	Allied Chemistry-I	4	3	3	50	50	100
	PACH209	Allied Chemistry Lab Work	2	-	-	50	50	100
	SK104	Communication Skills	2	1	-	-	-	-
	VE105A/B	Religion/Value Education-I	2	1	-	-	-	-
	CE103	Communicative English-I	-	1	-	-	-	-
<b>TOTAL</b>			<b>30</b>	<b>22</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
II SEMESTER	LT214	Tamil-II	5	3	3	50	50	100
	LE215AT	English-II	5	2	3	50	50	100
	BC206	Plant Biochemistry	3	3	3	50	50	100
	BC207	Human physiology	4	4	3	50	50	100
	PBC205	Main practical-II	3	3	3	50	50	100
	ACH210	Allied Chemistry-II	4	3	3	50	50	100

	PACH209	Allied Chemistry Lab Work	2	2	3	50	50	100
	SK204	Leadership skills	2	1	-	-	-	-
	VE205A/B	Religion/Value Education-II	2	1	-	-	-	-
	CE203	Communicative English-II	-	1	-	-	-	-
	<b>TOTAL</b>		<b>30</b>	<b>23</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
III SEMESTER	LT312	Tamil-III	5	3	3	50	50	100
	LE309T	English-III	5	2	3	50	50	100
	BC306	Microbiology	3	3	3	50	50	100
	BC307	Biophysical chemistry	4	4	3	50	50	100
	PBC302	Main practical-III	3	3	3	50	50	100
	AM310C	Allied Biostatistics-I	6	5	3	50	50	100
	SK304	Technical Skills-I	2	1	-	-	-	-
	VE306	Human Rights	2	1	3	50	50	100
	LE309P	English Lab-III	-	1	-	-	-	-
		OUTREACH	-	-	-	-	-	-
		SHELTERS	-	-	-	-	-	-
	<b>TOTAL</b>		<b>30</b>	<b>23</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
IV SEMESTER	LT411	Tamil-IV	5	3	3	50	50	100
	LE409T	English-IV	5	2	3	50	50	100
	BC407	Microbial Biochemistry	3	3	3	50	50	100
	BC408	Analytical Biochemistry	4	4	3	50	50	100
	PBC405	Main practical-IV	3	3	3	50	50	100
	AM409C	Allied Biostatistics-II	6	5	3	50	50	100
	SK404	Employability Skills	2	1	-	-	-	-
	VE406	Environmental Science	2	1	3	50	50	100
	LE409P	English Lab-IV	-	1	-	-	-	-
		OUTREACH	-	2	-	-	-	-
		SHELTERS	-	2	-	-	-	-
	Internship		<b>1*</b>	-	-	-	-	

	<b>TOTAL</b>		<b>30</b>	<b>27+1*</b>	-	-	-	-
<b>V SEMESTER</b>	BC522	Enzymology	4	4	3	50	50	100
	BC523	Intermediary metabolism	5	5	3	50	50	100
	BC524	Endocrinology	4	4	3	50	50	100
	BC525	Genetics	4	4	3	50	50	100
	PBC502	Main practical-V	5	4	6	50	50	100
	BC526A/B/C	<ul style="list-style-type: none"> <li>• Biomedical Instrumentation</li> <li>• Medical laboratory technology</li> <li>• Pharmacology (one out of three)</li> </ul>	6	4	3	50	50	100
	<b>SSP-I</b>	<b>Health Management</b>	-	<b>1*</b>	-	-	-	-
	NBC504	NME –Energy Builders	2	1	3	50	50	100
	<b>TOTAL</b>		<b>30</b>	<b>26 + 1*</b>	-	-	-	-
<b>VI SEMESTER</b>	BC620	Molecular Biology	5	5	3	50	50	100
	BC621	Immunology	4	4	3	50	50	100
	BC622	Medical Biochemistry	4	4	3	50	50	100
	PBC606	Main practical-VI	5	4	6	50	50	100
	BC623A	Subject Skill-I Biotechnology	5	5	3	50	50	100
	BC623B	Subject Skill-II Bioethics	5	5	3	50	50	100
	<b>SSP-II</b>	<b>Nutritional Biochemistry</b>	-	<b>1*</b>	-	-	-	-
	NBC604	NME – Health care and Disease management	2	1	3	50	50	100
		Certificate Courses NPTEL/MOOCs	-	<b>1*</b>	-	-	-	-
		<b>Project</b>	-	<b>2*</b>	-	-	-	-
	<b>TOTAL</b>		<b>30</b>	<b>28 + 4*</b>	-	-	-	-

**Sacred Heart College (Autonomous), Tirupattur District**

**1.2.1 List of New Courses**

**Department: B.Sc.BioChemistry**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>
1.	BC106	Cell Biology
2.	BC107	Biomolecules
3.	PBC102	Main practical- I
4.	ACH110	Allied Biochemistry-I
5.	PABC201	Allied Biochemistry Practical-I
6.	BC206	Plant Biochemistry
7.	BC207	Human physiology
8.	PBC205	Main practical-II
9.	ACH210	Allied Biochemistry-II
10.	PACH209	Allied Biochemistry Practical-II

## Semester-I

**Sub. Code: BC106**

**CELL BIOLOGY**

**3 Hours/3 Credits**

### Course Objectives:

- To understand the structure of prokaryotic and eukaryotic cellular organization and to know the fluid mosaic model and membrane transport mechanism.
- To learn about the chemical composition and functions of endoplasmic reticulum, golgi apparatus and lysosomes.
- To have in-depth understanding of the Structure, Chemical composition and functions of Mitochondria and Ribosomes.
- To learn the functions of peroxisomes and glyoxysomes and composition of cytoskeleton and extracellular matrix.
- To acquire knowledge on nucleus–structure, composition and functions of chromosomes cell cycle, cell division and cell death mechanisms.

### Course Outcomes:

S.No.	Description	Cognitive Level (K-level)
CO-1	Develop an understanding of the structure of cell and its difference between prokaryotes and eukaryotes	K6,K2
CO-2	Define and understand the fluid mosaic model and membrane transport	K1, K2
CO-3	Categorize the chemical composition and functions of endoplasmic reticulum, golgi apparatus and lysosomes.	K4
CO-4	Broad knowledge on the structure, chemical composition and functions of mitochondria, ribosomes, peroxisomes and glyoxysomes.	K3, K6
CO-5	Demonstrate a clear understanding of the composition of cytoskeleton and extracellular matrix.	K2
CO-6	Evaluate the mechanism of cell division with reference to mitosis and meiosis	K5

**UNIT-I:** Cell and its Theory, Structure of Plant and Animal cell. Cells-Prokaryotes and Eukaryotes, Difference between Prokaryotes and Eukaryotes.

**UNIT-II:** Membrane structure-Fluid Mosaic model, chemical composition and physical properties. Membrane Transport-Diffusion, Active and Passive.

**UNIT-III:** Structure, Chemical composition and functions of Endoplasmic Reticulum, Golgi apparatus and Lysosomes.

**UNIT-IV:** Structure, Chemical composition and functions of Mitochondria and Ribosomes. Functions of Peroxisomes and Glyoxysomes. Cytoskeletons.

**UNIT-V:** Nucleus-Structure, composition and functions of Chromosomes. Cell cycle and Cell divisions-Mitosis and Meiosis.

**Text Books:**

1. P.S Verma and V.K.Agarval (2016) Cytology (Cell Biology, Biomolecules and Molecular Biology), S.Chand Publishing, New Delhi.
2. Geoffrey M. Cooper and Robert E. Hausma (2015)[The Cell: A Molecular Approach, Seventh Edition](#), Sinauer Associates, Inc.

**References:**

1. J.M. Bery, J.L. Tymoezko and L. Stryer (2008) Biochemistry, 6<sup>th</sup> Ed., W.H. Freeman and Company, New York.
2. D.L.Nelson, and M.M. Cox (2008) Lehninger Principles of Biochemistry, 5<sup>th</sup> Ed., W.H. Freeman and Company, New York.
3. T.D.Pollard and W.C. Earnshaw (2002), Cell Biology, Saunders Publishing and Co, New York.
4. C.B. Powar (1994), Cell Biology, Second edition, Himalayan publishing house, Mumbai.

## Semester-I

### Semester-I

**Sub. Code: BC107**

**BIOMOLECULES**

**4 Hours/4 Credits**

#### Course Objectives:

- To study the structure and functions of large biological macromolecules.
- To understand the organic chemical principles in life processes.
- To introduce the knowledge of lipid and their importance.
- To provide in-depth understanding of Nucleic acids and its structure.
- To categorize the source, applications of vitamins and minerals.

#### Course outcomes:

S.No.	Description	Cognitive Level (K-level)
CO-1	Understand the knowledge of carbohydrates and their classifications in detail	K2, K3
CO-2	Acquire the basic knowledge on the classification and structure of amino acids and classify proteins based on its physical and chemical properties	K3
CO-3	Discuss the importance, classification and functions of lipids	K2
CO-4	Enumerate the structure and properties of nucleic acids and its types	K1
CO-5	Explore and recommend the source, applications of vitamins and minerals	K4, K5
CO-6	Compile the basic information on the sources, mechanism and applications of macro and micro elements	K6

**UNIT-I:** Classification of Carbohydrates. Isomers, Anomers, epimers, enantiomers and mutarotation. Ring and linear structure (Haworth projection formula). Structure, Properties and Functions of Monosaccharides, Structure and Functions of Oligo (Di-Maltose, Lactose and Sucrose) and Polysaccharide (Homo-Starch, Glycogen & Cellulose; Hetero-Proteoglycan).

**UNIT-II:** Classification and structure of Amino acids. Essential and Non-essential amino acids. Properties of amino acids—Physical and Chemical, Zwitter ion. Classifications of Proteins based on solubility, shape, composition and biological function. Structure of Proteins. Denaturation and Renaturation of Proteins.

**UNIT-III:** Classification of Lipids, Essential fatty acids, Structure, Types and Functions of Phospholipids. Structure and functions of Glycolipids and Cholesterol.

**UNIT-IV:** Structure of purine and pyrimidine nucleotides. Structure and Properties of DNA–Tm, Denaturation and Renaturation, Hypo & Hyperchromicity and Types of RNA.

**UNIT–V:** Vitamins–**Fat and Water Soluble Vitamins, Chemical name, Sources, Daily requirements, Functions and Deficiency disorders. Minerals-Micro (Fe, Zn, Cu, I, F, Mn, Mo) and Macro elements (Na, Mg, Cl, Ca, P, K, S)–source, biological importance and Deficiency disorders.**

**Text Books:**

1. A.C. Deb (2001), Fundamentals of Biochemistry, New Central Book Agency Pvt., Ltd., Calcutta.
2. Murray, R. K., D. K. Granner, P. A. Mayes and D. W. Rodwell. 2006. Harper’s Biochemistry, 25<sup>th</sup> edition, Prentice Hall, New Jersey.
3. J.L Jain., (2005). Fundamentals of Biochemistry. S.Chand Publishing, New Delhi.
4. D.L.Nelson, and M.M. Cox (2008) Lehninger Principles of Biochemistry, 5th Ed, W.H. Freeman and Company, New York.

**References:**

1. R.K. Murray, D.K. Granner, P.A. Mayes, D.W. Rodwell (2006), Harper’s Biochemistry, twentyfifth edition, Prentice Hall, New Jersey.
2. D. Voet, and G.Voet (2006), Biochemistry, John Wiley and Sons, New York.
3. G.L Zubay (1999) Biochemistry, 4th Ed, WCB, McGraw-Hill, New York.
4. Ambika Shanmugam (1998). Fundamentals of Biochemistry for Medical Students.
5. U. Satyanarayana., (2006) A textbook of Biochemistry, Books & Allied, Kolkata.



## Semester-I

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**Sub. Code: PBC102**

**MAIN PRACTICAL-I**

**3 Hours/3 Credits**

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### I. Qualitative analysis of carbohydrate

Arabinose, Glucose, Fructose, Maltose, Lactose, Sucrose and Starch.

### II. Qualitative analysis of Amino acid

Arginine, Cysteine, Tyrosine, Tryptophan, Histidine and Methionine.

## Semester-I

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**Sub. Code: ABC102**

**ALLIED BIOCHEMISTRY-I**

**4 Hours/3 Credits**

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### Course Objectives:

- To develop skill and acquire knowledge in fundamentals of Chemistry, Biology and will develop disciplinary theory and practical knowledge in the diversified areas of Biochemistry.
- To enable the students to understand the various perspectives of applied sciences that benefits mankind.
- To give fundamental knowledge about the course and encouraged to become unique by allowing them to perform experiments their areas of interest.
- To enable the students to equip themselves with the basic practical training in different areas of Biochemistry ranging from Metabolism, Nutrition, Plant Biochemistry, Enzymology, Clinical Biochemistry, Molecular Biology to Genetic Engineering, Biotechnology, etc.
- To help the students to take up further specialized Master level courses in these areas or to take up suitable assignments/jobs in Biotech/Biochemical industries.

**Course Outcomes:**

S.No.	Description	Cognitive level (K level)
CO-1	Help learners to define and understand the objectives of studying Biochemistry	K1, K2
CO-2	Analyze and understand the basic concepts of biochemical reactions that occurs in living systems	K4
CO-3	Provide students with learning experiences that help in still deep interests in learning biochemistry	K3
CO-4	Develop broad and balanced knowledge and understanding of biomolecules, key biochemical concepts, principles and theories related to biochemistry	K6
CO-5	Equip students with appropriate tools of analysis and with theoretical, technical and analytical skills to tackle issues and problems in the field of biochemistry	K4
CO-6	Recommend students to a wide range of careers that combine biology, plants and medicine.	K5

**UNIT-I:** Carbohydrates-Definition and Classification of carbohydrates, linear and ring forms (Haworth formula)–Glucose and Fructose. Physical properties–Mutarotation. Chemical properties-Oxidation, Reduction, Osazone formation. Disaccharide-Sucrose and Lactose, Polysaccharides-Starch and Cellulose–Sources and Functions.

**UNIT-II:** Amino acids-Definition and classification of amino acids, Physical Properties-Amphoteric nature, Isoelectric point, Isoelectric pH and Zwitter ion. Proteins–Classification, shape and size, solubility and functions. Structure of protein– Primary, Secondary, Tertiary and Quaternary.

**UNIT-III:** Lipids-Definition, classification and functions. Occurrence and biological functions- simple lipids, compound lipids (e.g. phospholipids) and derived lipids: steroids (e.g. Cholesterol). Fatty acids–Saturated and Unsaturated.

**UNIT-IV:** Nucleic acids-Nucleoside, Nucleotides, Types of Nucleic acids, DNA- Double helical model of DNA and its biological functions. RNA–Structure, Occurrence, chemistry and its biological functions of tRNA, mRNA and rRNA.

**UNIT-V:** Enzymes-Definition, classification of enzymes with one example. Mechanism of enzyme action. Lock and key mechanism, Induced fit theory. Biological functions of enzymes. Factors affecting enzyme activity–pH, temperature and substrate concentration. Michaelis-Menton equation.

**Text Books:**

1. A.C. Deb (2001), Fundamentals of Biochemistry, New Central Book Agency Pvt., Ltd., Calcutta.
2. Ambika Shanmugam. 1998. Fundamentals of Biochemistry for Medical Students.
3. Satyanarayana, U. 2006. A textbook of Biochemistry, Books & Allied, Kolkata.

**References:**

1. Chatterjee, N and Rana Shinde. 2012. Textbook of Medical Biochemistry, 8<sup>th</sup> edition, Jaypee publication, New Delhi.
2. Jain, J. L. 2005. Fundamentals of Biochemistry. S. Chand Publishing, New Delhi.
3. Murray, R.K., D.K. Granner, P.A. Mayes and D.W. Rodwell. 2006. Harper's Biochemistry, 25<sup>th</sup> edition, Prentice Hall, New Jersey.
4. Voet, D and G. Voet. 2006. Biochemistry, John Wiley and Sons, New York.

**Semester-I**

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**Sub. Code:PABC201 ALLIED BIOCHEMISTRY PRACTICAL-I 2 Hours/1 Credit**

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**I. Qualitative analysis of Carbohydrates**

Glucose, Fructose, Sucrose, Maltose and Starch.

**II. Qualitative analysis of Amino acids**

Tyrosine, Tryptophan, Cysteine, Methionine and Arginine.

**III. Volumetric estimation (Demonstration)**

Estimation of Ascorbic acid and Oxalic acid.

## Semester-II

Sub. Code: BC206

PLANT BIOCHEMISTRY

3 Hours/3 Credits

### Course Objectives:

- To provide the basic knowledge of plant cell and water absorption mechanism.
- To get familiar with photosynthetic mechanism and starch production cycle.
- To acquire knowledge about NPK cycle and its biological significance.
- To give detail idea about seed germination, primary and secondary metabolites.
- To explore the information about plant hormones and their physiological effects.

### Course Outcomes:

S.No.	Description	Cognitive Level (K-level)
CO-1	Understand the basic knowledge of plant cell and water absorption mechanism.	K2, K3
CO-2	Acquire knowledge on photosynthetic mechanism and starch production cycle.	K3
CO-3	Discuss about NPK cycle and its biological significance.	K2
CO-4	Describe about seed germination, primary and secondary metabolites.	K1
CO-5	Explore the information about plant hormones and their physiological effects.	K4
CO-6	Assess the in-depth principle and speculate the mechanism of plant life cycle	K5, K6

**UNIT-I:** Plant cell-Structure and Functions, Plant cell wall, Transpiration-Types, Mechanism and Factors affecting transpiration, Mechanism of Water Absorption–Passive and Active.

**UNIT-II:** Photosynthesis–photosynthetic pigments and chloroplast. Light reaction– Photosystems, Cyclic and non-cyclic photophosphorylation, Calvin cycle, Hatch-Slack cycle.

**UNIT-III:** Cycles of Elements-N<sub>2</sub> cycle, Biochemistry of symbiotic and non-symbiotic N<sub>2</sub> fixation, Sulphur cycle and Phosphorous cycle.

**UNIT-IV:** Biochemistry of seed dormancy, seed germination, fruit ripening and Senescence, Primary and Secondary metabolites in Plants–Definition and Function.

**UNIT-V:** Plant growth regulators-Physiological effects of Auxins, Gibberellins, Cytokinins, ABA and Ethylene.

**Text Books:**

1. H.S. Srivastava (2006), Plant Physiology, Biochemistry and Biotechnology, Rastogi Publications, Merut.
2. V. Verma, Plant Physiology, (2001) 7th revised edition. Emkay publications.
3. V.K. Jain, (2000) Fundamentals of Plant Physiology, S.Chand Publishing, New Delhi.

**References:**

1. N.C. Gautam (2006), Plant Biotechnology, Shree Publishers.
2. Heldt HW (2005), 3rd Edition, Plant Biochemistry, Elsevier Academic Press Publication, USA.
3. A.J. Lack (2001).Plant Biology. Viva Books, New Delhi.
4. P.J. Lea and R.C. Leegood (1999), 2nd Edition, Plant Biochemistry and Molecular Biology, Wiley and Sons, New York.
5. Andrew Lack (2001) Plant Biology, Taylor & Francis, New York.

## Semester-II

### Semester-II

**Sub. Code: BC207**

**HUMAN PHYSIOLOGY**

**4 Hours/4 Credits**

#### Course Objectives:

- To understand the anatomy and physiology, various levels of organizations basic homeostatic mechanism.
- To elucidate and describe the composition, function of various body fluids like blood and lymph, their significance and related disorders
- To explain the morphology, physiology of circulatory, respiratory and digestive system and classify the structure of lungs, transport of gases between lungs and tissues. Explain the morphology, functions of kidney and nephron and their role in urine formation.
- To categorize the Structure and functions of nerve cells, conduction of nerve impulses, the role of neurotransmitters and reflex action.
- To speculate the physiology of muscle contraction in co-ordination with the joints, their articulation and skin.

#### Course Outcomes:

S.No.	Description	Cognitive Level (K-Level)
CO-1	Define and explain the anatomy and physiology, various levels of organizations basic homeostatic mechanism.	K1, K2
CO-2	Explain and determine the composition, function of various body fluids like blood and lymph, their significance and related disorders	K2, K3
CO-3	Explain and sketch the morphology, physiology of circulatory, respiratory and digestive system.	K2, K4
CO-4	Categorize the structure of lungs, transport of gases between lungs and tissues. Explain the morphology, functions of kidney and nephron and their role in urine formation.	K2, K4
CO-5	Evaluate the structure and functions of nerve cells, conduction of nerve impulses, the role of neurotransmitters and reflex action.	K5
CO-6	Speculate the physiology of muscle contraction in co-ordination with the joints, their articulation and skin.	K6

**UNIT-I:** Components of Blood, Morphology and functions of blood cells. Blood groups and Rh factor. Lymphatic system and Composition of lymph. Circulatory system - Heart anatomy, Pace maker, Cardiac cycle and ECG.

**UNIT-II:** Structure of Lungs, Transport of gases between lungs and tissues. Structure and functions of Kidney and Nephron. Mechanism of urine formation.

**UNIT-III:** Structure and functions of digestive system. Digestion and Assimilation of Carbohydrate, lipids, proteins and nucleic acid. Mechanism of HCl secretion in stomach. Role of hormones involved in digestion.

**UNIT-IV:** Structure and functions of nerve cells, Conduction of nerve impulse in myelinated and non-myelinated sheath. Neurotransmitters, Reflex action, Sleep and awake.

**UNIT-V:** Muscles- Types, structure and functions. Ultra structure of skeletal muscle- light band, dark band, Sarcomere, Filaments–Thick (myosin) and Thin (actin, tropomyosin and troponin). Contraction and relaxation of skeletal muscle via  $\text{Ca}^{2+}$  pump.

#### **Text Books:**

1. N. Arumugam (2001) Animal Physiology, Saras publication.
2. Sembulingam K and Sembulingam P (2010). Essentials of medical physiology. 5<sup>th</sup> ed. Jaypee Brothers Medical Limited. pp. 85-89.
3. R.A. Agarwal, Anil. K, Srivastava, KaushalKumar (1986), Animal physiology and Biochemistry- 3rd edition. S.Chand Publishing, New Delhi.

#### **References:**

1. J. Brachet and A. E. Mirsky (1963), The Cell-Biochemistry, physiology and morphology, Academic Press.
2. William. F. Ganong. (2005), Review of Medical Physiology McGraw-Hill Medical; 22 edition.
3. Guyton (1996) Human Physiology and Mechanisms of Disease. Saunders Publications; 6th edition.
4. A.C. Guyton and J.E. Hall (2000), Text Book of Medical Physiology. Harcourt Asia.
5. Anne Waugh and Allison Grant (2018). Ross & Wilson anatomy and physiology in health and illness. Edinburgh: Elsevier, 2018.

**Semester-II**

**Semester-II**

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**Sub. Code: PBC205**

**MAIN PRACTICAL-II**

**3 Hours/3 Credits**

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**I. Titrimetric methods**

1. Estimation of Ascorbic Acid
2. Estimation of Glucose by Benedict's Method
3. Estimation of Glycine by Sorensen's Formal Titration method
4. Estimation of Calcium from Milk

**II. Preparations**

1. Preparation of Starch from potato
2. Preparation of Casein from Milk
3. Preparation of Albumin from Egg
4. Mitosis and Meiosis of Onion root tip.

**Semester-II**

**Allied Biochemistry-II**

**Semester-II**

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**Sub. Code: ABC202**

**MAIN PRACTICAL-II**

**3 Hours/3 Credits**

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**I. Titrimetric methods**

5. Estimation of Ascorbic Acid
6. Estimation of Glucose by Benedict's Method
7. Estimation of Glycine by Sorensen's Formal Titration method
8. Estimation of Calcium from Milk

**II. Preparations**

5. Preparation of Starch from potato
6. Preparation of Casein from Milk
7. Preparation of Albumin from Egg
8. Mitosis and Meiosis of Onion root tip.



## Semester-II

### Allied Biochemistry Practical-II

#### Semester-II

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**Sub. Code: PABC202 ALLIED BIOCHEMISTRY PRACTICAL-II 2 Hours/1 Credit**

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#### I. Urine Analysis

Qualitative analysis of Normal and pathological (abnormal) urine.

#### II. Haematology

1. Estimation of Haemoglobin content by Sahli's method.
2. Determination of ESR.