

## **PG AND RESEARCH DEPARTMENT OF BIOCHEMISTRY**

### **UG COURSE: B.Sc - BIOCHEMISTRY**

#### **PROGRAMME OUTCOME (PO) – UNDER GRADUATE**

- Students will have the ability to explain, evaluate and effectively concern with areas such as languages, computer, mathematics, Core Papers and Practicals.
- Students will demonstrate an awareness of the impact of chemistry on the environment, society and other cultures outside the scientific community.
- Students will have thorough knowledge to follow proper procedures and Laboratory regulations for safe handling, use and disposal of chemicals.
- Have the ability to describe the concept of computer oriented technical skills and modern instrumental tools necessary for research practice.
- Illustrate high level of professional look, ethical values and social responsibility for learning throughout their life.

#### **PROGRAMME SPECIFIC OUTCOME (PSO) – UNDER GRADUATE**

- Students will understand the functions of biomolecules with the help of molecular structure.
- Students will gain knowledge in laboratory techniques including Microbiology, Clinical Biochemistry, Chemistry, Bioinformatics etc.
- The course covers scientific methods to process the experiments and communicate effectively for the scientific reasoning and research.
- Core papers demonstrate and help to acquire knowledge in fundamental biological principles, intermediate pathway and regulation of biological process.
- Elective papers like Immunology, Genetic Engineering, Animal and Plant Biotechnology will make them to gain thorough knowledge in biological techniques and tissue culture techniques.
- Students will have excellent career opportunities in research, pharmaceutical industries, clinical laboratories etc.,
- The course ensures students to pursue higher education.

### SUBJECT OUTCOME

Semester	Subject Code	Name of the Subject	Subject Outcome
I	11T	Language I	Language helps to understand the actuality around us and enhanced language sensitivity.
	12E	English I	Students are able to use correct English in oral as well as written form.
	13A	Biomolecules	Biomolecules involve basic idea of cellular components such as carbohydrates, lipids, proteins, nucleic acids, vitamins and biological process.
	13B	Cell Biology	Cell Biology gives knowledge about the relationship between cellular organization, cell organelles, functions of cell organelles and application of cell biology in research.
	1AH	Allied Chemistry I	Will acquire knowledge about the bonding, pH, buffer, isomerism, kinetics of solutions, environmental and industrial uses of chemicals.
	1FA	Environmental studies	Will provide the sound knowledge about the environment and give awareness about protection of nature.
II	21T	Language II	Language is not only a means of communication, it is also a medium through which most of our knowledge is acquired.
	22E	English II	Students achieve a proper skill in oral, reading, written communication and effective manner.
	23P	Biomedical Instrumentation	Gain knowledge about the instruments used in medical field and also helps to learn about the principle and applications of the instruments.
	2AH	Allied Chemistry II	Give the knowledge of coordination compounds, metal refining, energetic, Biomolecules and aromatic compounds.
	2FB	Human Rights	Students will have knowledge on the role of human rights in current issues relating to terrorism, religion, ethnicity, gender and also develops analytical skills.
	23P	Core Biochemistry Practical – I	Students will successfully finish biochemistry practical with broad knowledge determination procedure of biological samples and separation techniques.
	2PH	Allied Chemistry Practical	Acquire knowledge about the precision, analyze the nature of salts, acid, base, buffer, solution and record of experiments.
III	31T	Language III	Students acquire skills in writing meaningful personal texts, purposeful information texts and effective imaginative texts.
	32E	English III	Students develop their communication in a practiced manner without grammatical errors by having a good working knowledge of communicating in English.

	33A	Enzyme and Enzyme Technology	Can enrich their knowledge about nature, source, biological activity & industrial applications of enzymes.
	33B	Microbiology	Provide a broad foundation in basic microbiology which emphasis various microorganisms and infections.
	3AR	Basic mathematics	Students will have ability to apply mathematics and workout two or more numbers and interprets simple data.
	3ZA	Bioinformatics and Medical Coding	Will get knowledge in the usage of computer, database functions, internet use for biological sequence of data and can design to produce novel compound. Medical coding involves the understanding of medical procedures and diagnoses related to medical language information.
	3FD	Women's Rights	Explains about women's experiences due to race, ethnicity and class. Study how women are symbolized in language and culture. Helps to analyze the causes of violence against women.
IV	41T	Language IV	Introducing the structure and sounds of Tamil. Enabling the learners to carry out day-to-day conversations in spoken Tamil. Helping them learn and understand basic Tamil grammar. Introducing Tamil syllabic writing system and Tamil script thereby making them to read and write in Tamil, Making the learners feel competent in performing a variety of communicative tasks in Tamil and making them communicatively and functionally competent at this level.
	42E	English IV	Ability to write well, critically, creatively among different groups to communicate in different ways.
	43A	Intermediary Metabolism	Will get an awareness of energy production & metabolite synthesis from the metabolism of biomolecules in living system.
	43P	Core Practical II	Students will gain knowledge biochemical techniques, enzyme assays to generate and analyze data.
	4PR	Computer programming in C	Students will learn the organization of digital computer and will be exposed to the number systems. They will acquire sound knowledge and will be familiar in programming in C.
	4ZB	Basics of information Technology	Students will be able to design and develop the information technology based solutions.
	4FE	General awareness	Will create awareness about competitive exams. Students will get current updation.
V	53A	Human physiology	Will gain knowledge on the organ system and the mechanism of organ function. Helps to understand the Homeostasis and the relation between anatomical structure and function at the tissue, organ and system level.

	53B	Clinical Biochemistry	Will provide knowledge about the clinical disorders, causes and treatment.
	53C	Molecular Biology	Gives in-depth knowledge of biological or medicinal processes through the study of molecular mechanisms.
	53A	Genetic Engineering and Bioprocess Technology	Will give the introduction of gene manipulation and its application in genetic engineering and the methods of bioprocess technology.
	5ZC	Basics of Patent and Bioethics	Will gain basic information of IPR, patent protection and Bioethics.
VI	63A	Plant Biochemistry and Plant Therapeutics	Will acquire knowledge on plant growth and development and also its significance in human nutrition and health. Helps to evaluate application of plants in medicine.
	63B	Medicinal Chemistry	Enlighten about development of traditional and modern methods used for drug discovery
	6EA	Plant and Animal Biotechnology	The students will enrich their knowledge in plant and animal Biotechnology and their applications for production of Genetically Modified Organism.
	6ED	Clinical Laboratory Technology	Will gain knowledge in diagnosis of disease state, clinical parameters and its interpretations.
	63P	Core Practical III	Acquire knowledge in the quantitative and qualitative estimation of biological components in Urine and Serum and its role of structure in reactivity of biomolecules
	63Q	Core Practical IV	Understand the basic handling of microbiological techniques, Immunological techniques, Hematology techniques and significance of biochemistry.
	6ZP	Skilled Based Subject IV Practical Bioinformatics I and II	Students will attain knowledge on structure prediction, protein and nucleic acid sequence analysis, sequence similarity, <i>insilico</i> techniques and docking tools
	67A	Extension Activities	Students will have competency to perform testing in medical laboratory techniques, analytical techniques, laboratory services, hematology, chemistry, microbiology, urine analysis, body fluids, molecular diagnostics and immunochemistry.

## **PG COURSE: M.Sc - BIOCHEMISTRY**

### **PROGRAMME OUTCOME (PO) – POST GRADUATE**

- To provide fundamental and advanced knowledge to expertise the students in order to produce skilled based innovative graduates with a strong scientific intelligence.
- Students will demonstrate and understand the major concepts in major disciplines of biochemistry such as Biopolymers, Analytical Biochemistry, Immunology, Advanced Clinical Biochemistry, Pharmaceutical Chemistry, Biotechnology etc.,
- To promote independent, collaborate and demonstrate the professional, ethical responsibilities of the Life Science profession.
- Demonstrate the students to identify the communal problems, to formulate, execute in research through relevant review of literature and solve substantiate conclusions.
- To encourage the students about intellectual property by publishing research articles in Seminar, Conference, Journals and Patents.
- To make the students to practice, communicate effectively and professionally to meet the global challenge.

### **PROGRAMME SPECIFIC OUTCOME (PSO)**

- Students will have Knowledge in the field of Biochemical techniques and Instrumentation.
- They will acquire sound knowledge in the field of Clinical Biochemistry, Microbial Biochemistry and Enzyme Technology.
- Students will gain the knowledge in interdisciplinary subjects like Genetic Engineering, Immunology, Molecular Biology, and Plant & Animal Biotechnology fields.
- They will acquire practical knowledge in Clinical, Microbiology and Plant Tissue Culture Techniques.
- They will gain knowledge in Research field from Research Methodology, Biostatistics and Project work.
- Students will have excellent placement opportunity in Industries, Medical Coding, Pharmaceutical companies, Clinical Laboratories, Fellow projects, Research Assistant and Scientist.

### SUBJECT OUTCOME

Semester	Subject Code	Name of the Subject	Subject Outcome
I	13A	Biopolymers	Will possess a sound knowledge on Structure, Chemical properties and reactions of the biomolecules and their biopolymers.
	13B	Analytical Biochemistry and Bioinformatics	Students will know the importance of principle mechanism of analytical techniques and instruments, quality assurance, Spectrometry and Chromatography. To have scientific temper, optimistic approach, analytical abilities and practical skills among the young minds.
	13C	Enzyme and enzyme Technology	Will impart the knowledge of nature, source, biological activity, kinetics & industrial applications of enzymes.
	13D	Cellular Biochemistry	Helps to enrich about the fundamentals of the cell biology and also to understand the structure and functions of living organisms their life process and biochemical basis of motility.
	13E	Plant Biochemistry and Biotechnology	Gain knowledge about various metabolic pathways in plants and about production of transgenic plant.
	1EA	Plant Tissue Culture	Provide knowledge on Plant Tissue Culture method and its applications
	II	23A	Microbial Biochemistry
23B		Immunology	Can enrich their knowledge about immune cells, Immune systems, importance of immune system, disease caused by disorders of the immune system and the latest methods of detecting disease causing pathogens, its treatment using novel vaccines
23C		Advanced Clinical Biochemistry	Gain basic knowledge on the biochemistry, pathophysiology associated with tests performed in a clinical biochemistry laboratory. Helps to identify and interpret results related to routine clinical chemistry
23D		Molecular Biology	Will impart knowledge the understanding in most significant molecular and cell based methods
23P		Core I Biochemistry Practical	Achieve Knowledge on Clinical assay of samples with broad way of molecular mechanism, recombinant technique, immunological technique and <i>insilico</i> study in Bioinformatics tools
2EA		Animal Tissue Culture	Provide the knowledge in requirements and applications of animal tissue culture.
		33A	Biostatistics

III	33B	Metabolism and Metabolic Regulation	Will acquire knowledge in the principles of metabolic biochemistry, the functions of metabolic pathways and how these pathways are controlled and interrelated. Helps to understand the molecular basis of control of metabolism.
	33C	Genetic Engineering	Enquire knowledge on genetic engineering methods, application and production of Genetically Modified Organisms.
	33D	Endocrinology	Students will gain information about various hormones and their effect on human due to their hypo and hyper secretions.
	33E	Pharmaceutical Chemistry & Neurochemistry	Can enrich their knowledge of nature, occurrence, mechanism and role of drugs in various disease conditions.
	3PC	Methods in Molecular Biology	Will acquire their knowledge about the experimental methods in molecular biology.
IV	43P	Core II Biochemistry Practical	Students will learn and manage the biochemical samples, perform the staining and microbiological tests, enzyme assays and clinical interpretations of the analysis.
	4EP	Elective Practical	Students will learn the techniques of Plant Tissue Culture and expertise in molecular techniques Expected
	47V	Project work	Project work will make the students to know the importance of work undertaken in a research group. Students will be able to plan carefully, will design own experiments and will learn to plan research programmes in current field. The project will also give an opportunity to reflect on their aptitude and enthusiasm for a research career.