JAYA COLLEGE OF ARTS AND SCIENCE

B.Sc Biochemistry

Program Outcomes for B.Sc Biochemistry Program

The program outcomes (PO) are the statement of competencies/ abilities. POs are the statement that describes the knowledge and the abilities the graduate/ post-graduate will have by the end of program studies.

- **PO1:** In-depth and detailed functional knowledge of the fundamental theoretical concepts and experimental methods of Biochemistry.
- **PO2:** Skills in planning and conducting advanced chemical experiments and applying structural-chemical characterization techniques.
- **PO3:** Apply/implement interface between, on the one hand, the history of Biochemistry and natural science and, on the other hand, issues pertaining to the areas of modern technology, health, and environment.
- **PO4:** Skill in examining specific phenomena theoretically and/or experimentally,
- **PO5:** Generation of new scientific insights or to the innovation of new applications of Biochemistry research.

Program Specific Outcomes for B.Sc Biochemistry Program

- **PSO-1.** After completion of the program the students are well poised to pursue careers in academic and industry in the areas of pharmaceutical and biotechnology.
- **PSO-2.** Health care professionals for services in the fields of clinical biochemistry, laboratory management, hospital and community services.
- **PSO-3.** The students will be able to demonstrate practical skills in handling biological specimens, analysis and their safe disposal.
- **PSO-4.** Apply the knowledge and expertise in industries, diagnostic laboratories and various research fields.

- **PSO-5.** Develop problem solving ability by utilizing the conceptual knowledge, analytical techniques, computational and statistical approaches.
- **PSO-6.** Facilitate to pursue post graduation in related fields in life sciences and contribute their knowledge to the betterment of the society in various research and health care sectors.

Course Outcomes

SEMESTER-I

COURSE TITLE	**Nutrition Biochemistry**
CODE	**SB21A**
CO. No	**Course Outcomes**
CO-1	To create awareness about the role of nutrients in maintaining proper health to study effect of nutrients in the biochemical process
CO-2	Understand Basics of nutrition, RDA, balanced diet and BMR
CO-3	Learn the RDA for infants, children, adults and expecting mothers, the various nutritional policies and nutritional interventional programmes.
CO-4	Describe the various disorders like anorexia, kwashiorkor, Marasumus
CO-5	To understand the nutritional significance of carbohydrates, lipids and proteins

SEMESTER- II

COURSE TITLE	**Cell Biology**
CODE	**SB22A**
CO. No	**Course Outcomes**
CO-1	To study the concept that the cell is the fundamental unit of life.
CO-2	To understand the communication between the cells

CO-3	To understand the structure and purpose of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes and organelles
CO-4	To gain insight about the membrane - transport mechanisms, membrane potentials and action potentials
CO-5	To understand the mechanism underlying about cancer , its prevention and treatment

SEMESTER-III

COURSE TITLE	**Biomolecules**
CODE	**SB23A**
CO. No	**Course Outcomes**
CO-1	Demonstrate the chemistry and the role of mono and disaccharides in living systems
CO-2	Elucidate the structural conformation of different types of polysaccharides
CO-3	Gain insight into the reactivity of aminoacids and nutritional importance of proteins
CO-4	Apply the relationship between the structure and functions of proteins in biological context.
CO-5	Elucidate the various levels of organization of Proteins and its biological importance

SEMESTER-IV

COURSE TITLE	**Biomolecules & Biochemical Techniques**
CODE	**SB24A**
CO. No	**Course Outcomes**
CO-1	Gain insight into the classes of lipids and characterization of fats by their constants
CO-2	Establish the diverse role of lipids in biological system

CO-3	Relate the structure of lipids with their reactivity in biological membrane systems and life processes.
CO-4	Establish the role of purine and pyrimidine bases in nucleic acid structure
CO-5	Acquire knowledge about principle of various centrifugation types and its applications
CO-6	Appreciate the principle, instrumentation and the difference between various spectroscopic methods to choose analyzing biological samples

SEMESTER-V

COURSE TITLE	**Enzymes**
CODE	**BBC-DSC07**
CO. No	**Course Outcomes**
CO-1	To understand the inhibition of enzymes
CO-2	To understand the kinetics of enzyme
CO-3	A thorough knowledge about the nature, classification, specificity of enzymes and coenzymes
CO-4	To study about the isolation, Purification and characterization of enzymes
CO-5	To gain knowledge about immobilization, and applications of enzymes

COURSE TITLE	**Metabolism**
CODE	**BBC-DSC08**
CO. No	**Course Outcomes**
CO-1	To understand the concepts of thermodynamics and the mechanism of energy transfer in ETC
CO-2	To understand the fate of the dietary carbohydrates

CO-3	To understand the fate of the dietary lipids
CO-4	To understand the fate of the dietary protein
CO-5	To study the metabolism of purine and pyridimine nucleotides and the interrelation among the carbohydrates, fat and protein metabolism.

COURSE TITLE	**Analytical Biochemistry**
CODE	**BBC-DSC09**
CO. No	**Course Outcomes**
CO-1	Understanding the concepts of acids, bases, buffers, various units used in expressing their strength and measuring their pH, buffers in body fluids.
CO-2	To understand the various techniques , types , operation and applications of chromatography
CO-3	To understand the in depth knowledge about the techniques, types, operation and applications of electrophoresis.
CO-4	Understanding radioactivity, its measurements and applications
CO-5	To study the basics of bioinformatics, nanotechnology and its applications in various fields.

COURSE TITLE	**Elective-I Physiology**
CODE	**BBC-DSE01**
CO. No	**Course Outcomes**
CO-1	Have Knowledge about Blood composition and its function, blood clotting mechanism.

CO-2	Gain knowledge about blood pressure and to create awareness about cardiovascular diseases
CO-3	To inculcate knowledge about the muscular and nervous system, role of neurotransmitters in physiology.
CO-4	To acquire in depth knowledge about respiratory and to create awareness about lung disorders
CO-5	To learn about the reproductive system and to know about the reproductive disorders and to introduce the organization of endocrine system and classification of hormones,

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SEMESTER- VI

COURSE TITLE	**Clinical Biochemistry**
CODE	**BBC-DSC10**
CO. No	**Course Outcomes**
CO-1	To gain knowledge on scope of clinical biochemistry
CO-2	To understand the alteration in biochemical components during various clinical conditions
CO-3	To get acquainted with the role of enzymes in diagnosis of various diseases.
CO-4	To become aware with the variations in the levels of trigycerides and lipoproteins and their relationship with various diseases
CO-5	To highlight the importance of various biochemical parameters in the diagnosis of diseases .

COURSE TITLE	**Molecular Biology**
CODE	**BBC-DSC11**
CO. No	**Course Outcomes**
CO-1	Gain knowledge about the various types of DNA, the organization of genes to chromosomes in prokaryotes and eukaryotes

CO-2	Understand the molecular basis of DNA synthesis, know the importance of the process, and the role of inhibitors of DNA as drugs
CO-3	Understand the process of RNA synthesis, post transcriptional modifications and apply the same to understand the role of antibiotics.
CO-4	To discuss about the genetic code, molecular basis of protein synthesis & modification
CO-5	To study the detailed mechanism of DNA mutation, Repair system and understand the use of molecular process in disease diagnosis.

COURSE TITLE	**Elective-II Immunology**
CODE	**BBC-DSE02**
CO. No	**Course Outcomes**
CO-1	Understand about the types of immunity, lymphoid organs and the cellular basis of immunity
CO-2	Obtain knowledge on types of antigens, antibodies and activation of complements
CO-3	Gain insight into various in vitro reactions between antigen and antibody and its application in clinical diagnosis
CO-4	Apprehend the enormous scope of different types of vaccines
CO-5	Acquire knowledge on autoimmunity, hypersensitivity and transplantation immunology

COURSE TITLE	**Elective-III Biotechnology**
CODE	**BBC-DSE03**
CO. No	**Course Outcomes**
CO-1	Basic knowledge of recombinant DNA technology, DNA manipulation in prokaryotes and eukaryotes, engineering of DNA

CO-2	Use of cloning and vectors, creation of genomic and cDNA libraries and their applications.
CO-3	To understand the methods for production of proteins using recombinant DNA technology and their applications
CO-4	To understand the basics of tissue culture, Transgenesis and stem cell technology
CO-5	To understand the fermentation technology –. risks, and safety aspects and patenting in biotechnology

COURSE TITLE	**CORE-III: PRACTICAL – I**
CODE	**BBC-DSC03**
CO. No	**Course Outcomes**
CO-1	To understand the concepts of titremetric experiments
CO-2	To acquire knowledge about the biochemical preparation
CO-3	To identify the spotters related to cell organelles

COURSE TITLE	**Core IV- Practical-II**
CODE	**BBC-DSC06**
CO. No	**Course Outcomes**
CO-1	To understand the qualitative analysis of carbohydrates and amino acids
CO-2	To determine the Saponification, iodine and acid value of oil
CO-3	To analyze the colorimetric estimations of protein, nucleic acids, carbohydrate and nucleic acids

CO-4	To understand the chromatographic techniques

COURSE TITLE	**CORE-XII: PRACTICAL- III**
CODE	**BBC-DSC12**
CO. No	**Course Outcomes**
CO-1	To attain knowledge about the collection and preservation of urine and blood samples
CO-2	To analysis the qualitative and quantitative analysis of urine and blood
CO-3	To analyze the enzyme studies
CO-4	To understand the fate of the dietary protein
CO-5	To study the basic of blood grouping, counting and sedimentation rate

COURSE TITLE	**CORE-XIII: PROJECT**
CODE	**BBC-DSC13**
CO. No	**Course Outcomes**

CO-1	The students are encouraged to carry out small project work of their choice to quench their curiosity.
CO-2	To able to understand theory of research.
CO-3	In order to understand research, student can undertake a small dissertation work where he/she exhaustively performs the literature search and compiles them as a meaningful presentation.