

**Programme Specific Outcomes (PSO) and Course Outcomes (CO) at Rajah Serfoji
Government College, Thanjavur-613005, Tamilnadu, India.**

DEPARTMENT OF BIOCHEMISTRY

PSOs
 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. Communicate the fundamental concepts of specific molecules, enzymes, cells, organ systems and metabolism of compounds.
 PSO-5. Apply the knowledge and expertise in industries, diagnostic laboratories and various research fields.
 PSO-6. Impart practical skills and scientific knowledge in domains of Molecular biology, enzymology, genetics, clinical biology and immunology.
 PSO-7. Develop problem solving ability by utilizing the conceptual knowledge, analytical techniques, computational and statistical approaches.
 PSO-8. 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 code/Paper/ Semester	Title	Course Outcomes
S1BC1 Core Course -1	Biomolecules	understand the role of sugars in energy production and living systems. Apply the link between the structure and functions of proteins in biological context. Analyse the role of lipids and apply the techniques to identify their purity. Remember the structure of lipids with their reactivity in biological membrane systems and life processes. Evaluate the structural studies to the biological processes like replication, transcription and translation
S2BC2 Core Course -2	Biochemical techniques	understand the reactions of thermodynamics Apply the various types of chromatographic techniques Analyse protein and DNA by electrophoresis Remember basics of calorimetry Evaluate the uses of radioisotopes

S2BCP1 Core Course - 3	Major Practicals- I	Apply the techniques for qualitative analysis Acquiring skills on identification of biomolecules.
S3BC3 Core Course - 4	Human physiology	Understand and analyze blood cells and blood groups , Blood clotting mechanism.Apply and Outline the muscular and nervous sytem, Mechanism of muscle contraction and structure of brain and spinal cord.Utilise the knowledge about the structure kidney and nephron ,To understand the mechanism of Urine formation and learn the concept of Dialysis.Acquire knowledge about the components of Digestive system,HCL formation and Digestion process.Compile the classification of Hormones and its biological role.
S3SB1C SKILL BASED 1	Apiculture	Understand the life cycle of honey bee. Apply and learn honey bee foraging. Remember the importance of honey bee. Analyse honey composition and it nutritional value. Evaluate the financial assistance for apiculture .
S4BCP2 Core Course	Major Practical - II	Apply the methods for preparation of buffers Evaluate the estimation of biomolecules Attain technical knowledge on separation techniques
S4BC4 Core Course - 6	Cell and molecular biology	Understand the cell theory and cell structure. Learn cell structure with its organelles. Apply the experiments for DNA as a genetic material Remember genetic code , and various types of mutation Exemplify the protein synthesis mechanism.
S4SB2B SKILL BASED 2	Biofertilizer	Understand the type sof biofertilizers with its importance Remember nitrogen and phosphorus cycle. Apply mass cultivation techniques. Attain the kowledge about the vermiculture. Demonstrate the VAM association.
S5BC5 CORE COURSE 7	Enzymes	Remember the classification of enzymes and its properties.Coenzymes – its structure and functions Comprehend the methods of enzyme isolation and purification. Apply the kinetics of enzyme such as MM equation,LB plot and Eadie Einstein. Demonstrate the mechanism of enzymes – Chymotrypsin and lysozyme Discuss the immobilized enzymes and its applications
S5BC6 CORE COURSE 8	Biochemistry of Plants and Microbes	Remember the classification of enzymes and its properties Coenzymes – its structure and functions Comprehend the methods of enzyme isolation and purification. Apply the kinetics of enzyme such as MM equation,LB plot and Eadie Einstein. Demonstrate the mechanism of enzymes – Chymotrypsin and lysozyme. Discuss the immobilized enzymes and its applications
S5BCP3 Core Course -9	Major Practical - III	Demonstrate the ash and moisture content in food samples. Estimate the amount of nutrients in food samples.Demonstrate staining procedure
S5BCEL1A MAJOR ELECTIVE COURSE 1 (A)	Food and Nutrition	Understand the various types of food and food groups Outline the micro and macro nutrients. Illustrate the

		organization of hospital with its charts. Gain knowledge on need of nutrients for different age groups. Learn the diet therapy with its method and application.
S5BCEL1B MAJOR ELECTIVE COURSE 1 (B)	Hospital Management	Understand the Various principles of hospital management. Acquire the knowledge on leadership qualities in management. Illustrate the Hospital organization. Learn medical audit and insurance. Explore on hospital communication and health tourism
S5BCEL1C MAJOR ELECTIVE COURSE 1 (C)	Food Processing	Understand the Unit operation and food processing. Acquire the knowledge on rice and wheat technology. Explore ideas on mushroom cultivation, fish cultivation Find out the methods for preservation of vegetables. Demonstrate on various types of food preservatives.
S5BCEL2A MAJOR ELECTIVE COURSE 2 (A)	Bioenergetics and Metabolism	Understand the free energy and high energy compounds Acquire the knowledge on Biological oxidation. Outline the major pathways in carbohydrate metabolism Learn about lipid metabolism and its importance. Explore on basic reactions and its concepts in protein metabolism.
S5BCEL2B MAJOR ELECTIVE COURSE 2 (B)	Personal Hygiene	Learn health education with its principles and importance Acquire the knowledge on personal health and its factors Know the mental and physical health. Understand environmental health and its hazards. Explore concepts on solid waste management.
S5BCEL2C MAJOR ELECTIVE COURSE 2 (C)	Communication and Personality Development	Learn various types of communications. Know the importance of communication. Explore the concepts of group communication. Understand various types of interviews. investigate methodology of effective communication.
S5SELO1 Nonmajor Elective	Statistical data analysis	Learn various types of data. Classification of data and its tabulation. Know the measure of central tendency. Understand the measures of skewness. Evaluate the use of correlation analysis in science.
S5SB3C Skill based - 3	Mushroom Cultivation and Value education	Learn the basics of mushroom cultivation. Acquire the knowledge on structure and functions of various types of mushroom. Identify poisonous mushroom. Demonstrate the method of mushroom cultivation. Apply the nutritional and medical values of mushrooms
S6BC6 Core Course -10	Immunology	Know basic of immune response. Acquire the knowledge on types of immunoglobulins. Demonstrate the various immunological techniques. Understand immune haematology. Explore concepts on and reactions of hypersensitivity and its prevention.
S6BC7 CORE COURSE -11	Clinical Biochemistry	Study metabolic disorders. Learn disorders of carbohydrate metabolism Know the metabolism disorder of lipid metabolism Understand the disorders of protein metabolism. Discuss the disorders of endocrine systems

S6BC8 CORE COURSE-12	Pharmaceutical chemistry	Study the classification of drugs based on source. Learn the drug metabolism with its enzymes. Discuss the chemotherapy. Understand and apply the adverse reactions of drugs . Investigate the use of anaesthetics .
S6BCP4 CORE COURSE -13	Major Practical-IV	Estimate the compounds in urine samples. Estimate the various compounds in blood samples. Know the methods of heamatology.
S6BCEL3A MAJOR ELECTIVE-3 (A)	Basic biotechnology	Learn fermentation process. Discuss plant tissue culture. Application of plant biotechnology. Understand animal cell culture and its techniques. Investigate the waste water treatment and bioremediation
S6BCEL3B MAJOR ELECTIVE COURSE 3 (B)	Biotechnology for Human Welfare	Demonstrate the techniques including vermicomposting. Learn the food and dairy biotechnology. Application of biotechnology for disease and diagnosis. Understand and apply biotechnology for treatment and prevention. Knowing the basic concept of environmental biotechnology.
S6BCEL3C MAJOR ELECTIVE COURSE 3 (C)	Public health and hygiene	Learn public health and hygiene. Gain knowledge on Environmental hazards. Aware of communicable disease. Understand non communicable diseases. Deliberate the concept of health education in India.
S3ABC1 Allied I	General biochemistry	Learn and remember the biomolecules. Study the classification of carbohydrates and its functions Know the classification of proteins and lipids. Understand the nature of nucleic acid with its structure. Apply the uses of vitamins and vitamin deficiency diseases.
S4ABC2 Allied II	General biochemistry - II	Demonstrate the types of buffer systems. Learn the principle and applications of chromatographic Techniques. Understand the method of electrophoresis with its applications. Understand the method of colorimetry. Explore the techniques of GM counter and its applications
S4ABCP ALLIED PRACTICAL	Biochemistry Practical	Learn the qualitative analysis of carbohydrates. Demonstrate the preparation of buffers. Study and apply the separation of amino acids by paperchromatography.
S5BCELO1 NON MAJOR ELECTIVE FOR B.Sc Statistics	Health Science & Health Education	Learn types of nutrition and related diseases. Understand the vitamin and its deficiency diseases. Apply the knowledge of food preservatives. Create awareness on life style changes. Gain knowledge on health insurance policies , WHO, UNICEF
S6BCELO2 NON MAJOR ELECTIVE FOR B.SC	Nutrition & Health Science	Learn types of nutrition and related diseases Understand the vitamin and its deficiency diseases Apply the knowledge of food preservatives.

BIOTECHNOLOGY	Create awareness on life style changes Gain knowledge on health insurance policies , WHO, UNICEF
---------------	--

Programme Specific Outcomes (PSO) and Course Outcomes (CO) at Rajah Serfoji Government College, Thanjavur-613005, Tamilnadu

<p>PSOS</p> <p>PS-1 The student will be able to understand characterisation biomolecules in research.</p> <p>PSO-2 Students will understand the concept of spectrophotometer, relevant terms of uv-visible spectroscopy and outline of uv spectroscopy device.</p> <p>PSO-3 Students will learn basics of enzymology and will be familiar with important terms of enzymology.</p> <p>PSO-4 Students will learn different types of fermentation process, strain improvement methods and isolation of industrial important microorganisms.</p> <p>PSO-5 They will be able to describe the mechanisms of protein transport to various sub cellular sites and process of protein degradation.</p> <p>PSO-6 Learn to work as a team as well as independently to retrieve information, carry out Research investigations and result interpretations.</p> <p>PSO-7 Develop the ability to understand and practice the ethics surrounding scientific Research.</p> <p>PSO-8- Realize the impact of science in society and plan to pursue their research.</p>


Course code/Paper/ Semester	Title	Course Outcomes
S1PBC1 CORE COURSE -1	Chemistry of Biomolecules	Understand the classification and importance of various carbohydrates. Apply the protein and its structure. Learn the important class of lipids and its biological functions. Remember the basic structure and functions of nucleic acids. Apply the biological functions of minerals and vitamins.
S1PBC2 CORE COURSE-2	Analytical Biochemistry	Understand the types of centrifugation with its uses. Apply the different types of centrifugation. Learn and apply NMR and IR spectroscopy. Remember the basic concepts of electrophoresis. Analyse the samples by using PCR and testing.
S1PBC3 CORE COURSE-3	Cell biology and Physiology	Understand the gap junctions and integrins. Study the membrane assembly and membrane transport. Learn the composition and functions of blood including membrane proteins. Understand the composition and functions of CSF. Apply the concepts of neuromuscular junctions and ion channels.

S1PBCP1 CORE COURSE- 4	Major Practicals-I	Estimate the amount of vitamins and nucleic acids. Analyse the lecithin and lactose in the sample. Demonstrate the separation of compounds like amino acids, plant pigments and lipids by chromatography
S1PBCEL1A ELECTIVE COURSE - 1 (A)	Environmental Biology	Aware of evolution of life on earth. Understand the population ecology and its importance. Learn the biodiversity and its conservation techniques. Gain knowledge on different types of environmental pollution. Apply the concepts of biological cycles.
S1PBCEL1B ELECTIVE COURSE - 1 (B)	Ecology	Learn ecology and environment with its scope and importance. Understand the nature of solar system Learn about habitat and ecological niche .Gain knowledge on symbiosis and mutualism. Apply the concepts of biological cycles.
S1PBCEL1C ELECTIVE COURSE - 1 (C)	Developmental Biology	Remember gametogenesis. Understand the process of fertilization. Learn the basics of blastulation. Gain knowledge on placentation. Apply the concepts of artificial insemination.
S2PBC4 CORE COURSE 5	Metabolism and Regulation	Study the free energy and entropy. Understand the overview of metabolism. Learn fatty acid biosynthesis and its regulation. Attain basic knowledge on purine and pyrimidine. metabolism with its regulation. Apply the concepts of hormonal balance.
S2PBC5 CORE COURSE 6	Enzymes and Enzyme Technology	Remember the classification and nomenclature of enzymes Demonstrate the enzyme Kinetics with its significance Learn the structure and functions of coenzymes Gain knowledge on isoenzyme and enzyme regulation Apply the concepts of applications of enzyme in industry and clinical field
S2PBC6 CORE COURSE 7	Microbiology	Know the structure of bacteria and other microbes. Understand the method of microbial growth. Learn the techniques involved in microbial culture. Gain knowledge on virus classification and structure. Apply the theory of diseases caused by microbes.
S2PBCP2 CORE COURSE 8	Major Practical - II	Determine the enzyme kinetics. Understand the effect of various factors affecting enzyme activity. Demonstrate the isolation and staining techniques
S2PBCEL2A ELECTIVE COURSE - 2 (A)	Endocrinology	Know the basics of endocrine and its functions. Understand the thyroid hormones. Learn the gonadal hormones. Knowledge on adrenal hormones. Apply the theory of signal pathways.

S2PBCEL2B ELECTIVE COURSE - 2 (B)	Herbal Medicine	Know the basics of ethnomedicine. Understand the importance of medicinal plants. Learn the tribal medicine. Knowledge on Traditional medicine. Nutritive value of medicinal plants.
S2PBCEL2C ELECTIVE COURSE - 2 (C)	First Aid and Management	Know the basics of first aid assessment Understand the first aid for heart diseases. Learn the first aid for injuries and burns Knowledge the first aid for heat related injuries Apply the method for poison emergency
S3PBC7 CORE COURSE - 9	Immunology	Know the types of immunity. Understand the complement activation. Learn the role of MHC and its antigens. Knowledge on autoimmunity. Apply the immunological techniques.
S3PBC8 CORE COURSE 10	Clinical Biochemistry	Know the basics of disorders of carbohydrate metabolism. Understand the disorders of protein metabolism. Learn the disorders of nucleic acid metabolism. Knowledge on the test used for heart failure. Apply the method for liver and kidney function tests.
S3PBC9 CORE COURSE 11	Molecular Biology	Know the chromosomal organization of gene. Understand the DNA Replication. Learn the process of transcription. Knowledge on protein degradation. Apply the principles of gene regulation.

S3PBCP3 CORE COURSE 12	Major Practicals -III	Estimate the Level of cholesterol and LDH. Analyse the estimation of urine compounds. Demonstrate the purification of enzymes.
S3PBCEL3A ELECTIVE COURSE 3 (A)	Genetic Engineering	Know the basic of plasmid isolation. Understand the vectors used in gene cloning . Learn the cDNA, and Genomic library. Knowledge on gene transfer techniques. Application of genetic engineering.
S3PBCEL3B ELECTIVE COURSE- 3 (B)	Dairy Microbiology	Know the microbial quality. Understand the principles and guidelines for safety. Learn the detection of indicator organism. Knowledge on monitoring pathogens. Apply the principles of accreditation of lab.
S3PBCEL3C ELECTIVE COURSE- 3 (C)	Intellectual Property Rights and patenting	Know the introduction of IPR. Understand the trade mark. Learn the process of copy right Knowledge on trade secret laws. Apply the principles on international patent law.
S4PBC10 CORE COURSE 13	Advanced Pharmaceutical Chemistry	Know the classification of drugs. Understand the method of drug metabolism. Learn the mechanism of action of drugs. Knowledge on importance of medicinal plants. Apply the principles of preservatives.
S4PBCP4 CORE COURSE 14	Major Practicals – IV	Estimate the Level of lactose in milk. Determine enzyme activity. Demonstrate the isolation of DNA and Plasmid.
S4PBCEL4A ELECTIVE COURSE 4 (A)	Biotechnology	Know the types of bioreactors. Understand the method of microbes isolation. Learn the mechanism of plant tissue culture. Knowledge on importance of media for tissue culture Apply the principles of environmental pollution.
S4PBCEL4B ELECTIVE COURSE 4 (B)	Marine Microbiology	Know the marine diversity. Understand the marine microbes. Learn the mechanism of bioremediation. Knowledge on sea food microbiology. Application of marine products.
S4PBCEL4C ELECTIVE COURSE 4 (C)	Industrial Pollution and Safety control	Know the principles tannery. Understand the method of Cement technology.Learn the pollution waste. Knowledge on importance of fertilizer. Apply the principles of industrial safety.
S4PBCEL5A ELECTIVE COURSE 5 (A)	Biostatistics and Research Methodology	Know the principles of biostatistics. Understand the method of classification of data. Learn the measure of central tendency. Knowledge on measure of dispersion Apply the principles of biostatistics in research.

S4PBCEL5B ELECTIVE COURSE 5 (B)	Nanotechnology	Know the molecular nanotechnology. Understand the method of nanomedicine. Learn the nanomaterials. Knowledge on importance of x ray crystallography. Applications of nanotechnology.
S4PBCEL5C ELECTIVE COURSE 5 (C)	Environmental Biotechnology	Know the principles of environmental pollution. Understand the bioremediation. Learn the waste water treatment. Knowledge on bioleaching. Apply the principles of nitrogen fixation.


 PRINCIPAL,
 Rajarajeshwari Govt. College
 (Autonomous)
 TANJAVUR - 613 005