

J.J. College of Arts & Science (Autonomous), Pudukkottai

Department of Biochemistry

Course Outcomes

B.Sc. Biochemistry – USBC

Course Name - Biomolecules		Course Code - U1R1BCCC1
Upon Completion of the course students would be able to		
CO 1	Explain the significance of hydrophobic and hydrophilic forces for the structure of biomolecules with examples.	
CO 2	Explain the significance of steric effects for the structure of biomolecules and give examples.	
CO 3	Discuss the four structure levels of Proteins	
CO 4	Draw the basic structure of carbohydrates, nucleic acids, peptides/proteins and lipids.	
CO 5	Understand the building blocks of the biomolecules.	
Course Name - Core Practical-I		Course Code - U1R1BCCC2P
Upon Completion of the course students would be able to		
CO 1	Carry out qualitative and quantitative analysis of all the biomolecules.	
CO 2	Extract biomolecules from various biological sources.	
CO 3	Estimate the amount of biomolecules present in the given unknown sample	
CO 4	Determine rancidity in edible oil and its applications	
CO 5	Analyze and study the chemical and biochemical properties of bio molecules	
Course Name – Analytical Biochemistry		Course Code – U2R1BCCC3
Upon Completion of the course students would be able to		
CO 1	Characterize and purification of biological samples	
CO 2	Understand the therapeutic role of radioisotopes	
CO 3	Know the importance of buffer role in our body	
CO 4	Expresses the terms such as electrolyte, acid, base, and Buffers	
CO 5	An understanding of chemical methods employed for elemental and compound analysis.	

Course Name - Core Practical-II		Course Code – U2R1BCCC4P
Upon Completion of the course students would be able to		
CO 1	Describe the working principles of pH meter, pH indicator and estimation of macromolecules.	
CO 2	Explain the principles and instrumentation of colorimetry and spectroscopy	
CO 3	Classify electrophoretic separation methods	
CO 4	Understand the principles and instrumentation of chromatography methods	
CO 5	Chemical methods used for elemental and compound analysis	
Course Name - Enzymology		Course Code – U3R1BCCC5
Upon Completion of the course students would be able to		
CO 1	Synthesize drugs using enzyme inhibition studies.	
CO 2	Produce enzymes used in industrial purposes.	
CO 3	Characterize and purification of enzymes	
CO 4	Knowledges in the field of biosensors and immobilized systems.	
CO 5	Uses of enzymes in medicine, food, organic synthesis and genetics	
Course Name – Core Practical-III		Course Code – U3R1BCCC6P
Upon Completion of the course students would be able to		
CO 1	Explain the characteristics and catalytic mechanisms of enzymes	
CO 2	Identify enzyme inhibition patterns	
CO 3	Determine kinetics of single substrate enzyme catalyzed reactions	
CO 4	Characterize enzymes and design enzyme assays	
CO 5	Describe immobilization techniques, and their principles, advantages and disadvantages illustrate	

Course Name - Clinical biochemistry		Course Code – U4R1BCCC7
Upon Completion of the course students would be able to		
CO 1	Test the biological samples in the clinical lab.	
CO 2	Prevent the development of inherited disorder in future	
CO 3	Utilize the knowledge of organ function tests	
CO 4	Understand the normal and abnormal Functioning of organs	
CO 5	Able to research independently	
Course Name - Core Practical – IV		Course Code – U4R1BCCC8P
Upon Completion of the course students would be able to		
CO 1	Discuss the biochemistry and pathophysiology associated with tests performed in a Clinical biochemistry laboratory	
CO 2	Detect abnormal constituents of urine and explain its clinical significance	
CO 3	Compare and contrast the basic differences between carbohydrate, lipid and protein metabolism abnormalities.	
CO 4	Estimate serum bilirubin and understand its clinical significance	
CO 5	Describe and identify the main characteristics of diagnosis, screening, and prognosis of disease.	
Course Name – Molecular Biology		Course Code – U5R1BCCC9
Upon Completion of the course students would be able to		
CO 1	Describe replication, repair and recombination of DNA, in both prokaryotic and eukaryotic organism.	
CO 2	Explain the structure and function of RNA polymerase and how they are involved in transcription	
CO 3	Understand the concept of post-transcriptional modification, splicing, various patterns of gene expression	
CO 4	Understand the concept of operon and its structure and regulation	
CO 5	Understand genetic code, types of ribosome, RNA	

Course Name - Intermediary Metabolism		Course Code – U5R1BCCC10
Upon Completion of the course students would be able to		
CO 1	Understand the general design of metabolic pathways based on bioenergetic principle	
CO 2	Become aware of how carbohydrates, lipids and nitrogenous compounds are synthesized and degraded	
CO 3	Known how metabolic pathways are regulated and recognize the biochemical basis of some diseases arising defects in metabolism	
CO 4	Know about the adaptation to starvation and physical activity of the body	
CO 5	Present a case study on the nutrition deficiency disorder.	
Course Name - Human Physiology		Course Code – U5R1BCCC11
Upon Completion of the course students would be able to		
CO 1	Explain the major organ systems, and list the organs associated with each.	
CO 2	Describe the structure of major human organs and explain their role in the maintenance of healthy individuals.	
CO 3	Explain the interplay between different organ systems and how organs and cells interact to maintain biological equilibrium.	
CO 4	Explain how the activities of organs are integrated for maximum efficiency	
CO 5	An understanding of the functions of the body parts and their interrelationships.	
Course Name – Core Practical - V		Course Code – U5R1BCCC12P
Upon Completion of the course students would be able to		
CO 1	Describe diversity, classification and identification methods of microorganisms.	
CO 2	Explain the structure and function of bacterial cell including other organisms like fungi, Viruses, algae etc.	
CO 3	Explain the bacterial physiology and basic genetic systems of bacteria, bacteriophage and plasmids.	
CO 4	Demonstrate skills in medical microbiology and pathogen interaction with the host, Identification and application of antibiotics.	
CO 5	Demonstrate the knowledge as to how microorganisms interact with their environment and interaction between humans and microorganisms.	

Course Name - Immunology		Course Code - U6R1BCCC13
Upon Completion of the course students would be able to		
CO 1	State the role of the immune system in the human body.	
CO 2	Describe the function of phagocytes in the non-specific immune system.	
CO 3	Define the role of B-lymphocytes in the humoral response.	
CO 4	Describe antigen presenting cells and define their purpose.	
CO 5	Define the major histocompatibility complexes type 1 and 2 and explain Their functions. Explain how t-cells aid in eliminating pathogens from the body.	
CO 6	List the symptoms of the inflammatory response and explain their causes.	
Course Name - Plant Biochemistry		Course Code - U6R1BCCC14
Upon Completion of the course students would be able to		
CO 1	Understand the basic concepts of photosynthesis	
CO 2	Discuss the importance of transpiration and photo assimilation	
CO 3	Describe about stress physiology and secondary metabolites	
CO 4	Learn about important metabolic processes taking place in plants.	
CO 5	Acquire a detailed knowledge about molecular mechanisms of signalization and regulation	
Course Name – Fundamentals of Biology – I		Course Code - U3R1BCAC4
Upon Completion of the course students would be able to		
CO 1	Explain the systematic position of Plants and Animals	
CO 2	Understand The Classification of Plants and Animals.	
CO 3	Explain The Cell Organelles And its Functions	
CO 4	Understand The Coordination & Control In Animals & Plants	
CO 5	Understand The Developmental Process And Evolutionary Significance	

Course Name - Fundamentals of Biology Practicals		Course Code - U4R1BCAC5P
Upon Completion of the course students would be able to		
CO 1	Differentiate the cells of various living organisms	
CO 2	Identify different cellular structures using microscopic techniques	
CO 3	Study the permanent microscopic slides of mitosis.	
CO 4	Study the permanent microscopic slides of meiosis	
CO 5	Classify the prokaryotic cells (bacteria) using differential staining	
Course Name - Fundamentals of Biology-III		Course Code - U4R1BCAC6
Upon Completion of the course students would be able to		
CO 1	Explain the growth and reproduction of plants and animals	
CO 2	Understand the coordination & control in animals & plant	
CO 3	Understand the hormonal actions of plants	
CO 4	Understand the mechanism of nutrition and transport of animals	
CO 5	Learn cell cycle and its regulation in detail	
Course Name – Microbiology		Course Code - MBE
Upon Completion of the course students would be able to		
CO 1	Explain the processes used by microorganisms for their replication, survival, and Interaction with their environment	
CO 2	Describe diversity of microorganisms, bacterial cell structure and function, microbial growth And metabolism	
CO 3	Explain the general bacteriological and microbial techniques.	
CO 4	Understand the basic microbial function and study the comparative characteristics of prokaryotes and eukaryotes.	
CO 5	Understand the food preservation, fermented foods and production and importance bio Products	

Course Name - Biotechnology and Genetic Engineering		Course Code - MBE
Upon Completion of the course students would be able to		
CO 1	Understand principles of animal culture, media preparation. Explain invitro fertilization and embryo transfer technology.	
CO 2	Applications or recombinant DNA technology in agriculture, production of therapeutic proteins.	
CO 3	Understand the steps involved in recombinant DNA technology.	
CO 4	Explain the construction of DNA & cDNA library and their applications.	
CO 5	Understanding of modern engineering techniques used in biotechnology	
Course Name - Endocrinology		Course Code - MBE
Upon Completion of the course students would be able to		
CO 1	Promote the physical activity to enhance the activity of the hormone.	
CO 2	Analyze the hormonal disorder in the body	
CO 3	Use hormone study to prevent inherited disorder	
CO 4	Describe how glucose levels are maintained in the blood	
CO 5	Describe factors stimulating and inhibiting the secretion of each endocrine gland	
Course Name - Plant Biochemistry and Plant Therapeutics		Course Code - MBE
Upon Completion of the course students would be able to		
CO 1	Describe the plant cell and its organelles.	
CO 2	Use the various secondary metabolites for various treatments.	
CO 3	Extract the secondary metabolites from the plants.	
CO 4	Apply principles of plant genomics for development of therapeutically active herbs.	
CO 5	Understand general principles of biological screening of plant derived chemicals	

Course Name - Pharmaceutical Biochemistry		Course Code - MBE
Upon Completion of the course students would be able to		
CO 1	Learn the various tools and techniques available for the analysis of drugs.	
CO 2	Identify the various side effects of drugs.	
CO 3	Know about chemotherapy and anesthesia	
CO 4	Understand the medicinal and pharmaceutical importance of inorganic compounds	
CO 5	Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability.	
Course Name - Hospital and First Aid Management		Course Code - SBE
Upon Completion of the course students would be able to		
CO 1	Aware of management or administration of hospitals.	
CO 2	Know the direct connection between health care services and those supplying the services they require.	
CO 3	Responsible for education, overall patient care, research & community health care related to the organization.	
CO 4	Identify the most important action one can take in a life-threatening emergency.	
CO 5	Identify the major structures of the respiratory, circulatory, nervous, and musculoskeletal Systems.	
Course Name - Pain relief formulation and cosmetics		Course Code - SBE
Upon Completion of the course students would be able to		
CO 1	Know to apply the knowledge of preparing conventional dosage formulations.	
CO 2	Know to prepare the natural cosmetics products and their usage.	
CO 3	Select key ingredients suitable in the formulation of various cosmetics	
CO 4	Describe the guidelines for the regulation of herbal cosmetics by private bodies	
CO 5	Invention relates to topical pain relief formulations and methods of treatment.	
Course Name - Nutrition And Dietetics		Course Code - SBE
Upon Completion of the course students would be able to		
CO 1	Acquired knowledge in the biological value of foods.	

CO 2	Obtained awareness regarding the nutritive value of various food
CO 3	Improve the nutritional health of individuals with medical conditions
CO 4	Skills in food and nutrition with professional issues affecting the nutrition and/or dietetics fields.
CO 5	Demonstrate basic food preparation, quantity food production, and food presentation skills
Course Name - Plant & Animal Biotechnology	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Obtained knowledge in plant and animal tissue culture.
CO 2	Become aware of genetic engineering technologies.
CO 3	Cell lines, application of animal cell and tissue culture, biohazards and Biosafety.
CO 4	Economic aspects of transgenic animals and Ethical issues of animal welfare and animal rights.
CO 5	Understand the Shoot tip and Callus culture of medicinal plants
Course Name - Nanobiotechnology	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Acquired knowledge in protein and nucleic acid structure.
CO 2	Developed skill in synthesizing nanoparticles.
CO 3	Describe tools for properties of nanostructures.
CO 4	Explain methods of fabricating nanostructures.
CO 5	Discuss applications of nanomaterials and implication of health and safety related to nanomaterials.
Course Name - Biophysics	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Obtained knowledge about acids and bases
CO 2	Developed skill in preparing solutions of specific pH.
CO 3	Knowledge in calculating the normality, molarity and molality of a solution.
CO 4	Explain models of biological systems and models dealing with statistical mechanics and transport phenomena.

CO 5	Appraise the importance of various biophysical techniques
Course Name - Public health and Hygiene	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Acquired knowledge about the health concepts.
CO 2	Developed skill in identifying various health problems.
CO 3	identify current public health problems nationally and globally
CO 4	Frame a public health issue within an epidemiological context
CO 5	Analyze case studies of health issues
Course Name - First Aid Management and Safety Measures	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Identify the most important action one can take in a life-threatening emergency.
CO 2	Identify the major structures of the respiratory, circulatory, nervous, and musculoskeletal Systems.
CO 3	Explain why one should follow the emergency action steps/principles in any emergency.
CO 4	Identify the role and responsibilities of a First Aider
CO 5	Administer first aid to a casualty with minor burns and scalds
Course Name - Tannery Technology	
Course Code - SBE	
Upon Completion of the course students would be able to	
CO 1	Acquire knowledge in tannery industry.
CO 2	Know the various processes for the treatment of effluent
CO 3	Understand the practical aspects and science of leather making
CO 4	The different processing options available to tanneries
CO 5	The factors that impact on the global tanning industry