ISLAMIAH WOMEN'S ARTS AND SCIENCE COLLEGE
Permanently Affiliated to Thiruvalluvar University
Recognized by UGC under sections 2(f) and 12(B) of the UGC Act 1956
Accredited with "B" Grade by NAAC
Approved by the Government of Tamil Nadu
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B.SC BIOTECHNOLOGY

DEPARTMENT OF BIOTECHNOLOGY

PO1: Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study

PO2: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

PO3: Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO4: Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO5: Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

PO6: Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation

PO7: Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

PO8: Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

PO9: Reflective thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.

PO10 Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO 11 Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO 12 Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

PO 13: Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstratingthe ability to identify ethical issues related to one"s work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

PO 14: Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

PO 15: Lifelong learning: Ability to acquire knowledge and skills, including „Learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and

cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling

PSO1: Disciplinary Knowledge: Understand the fundamental principles, concepts, and theories related to Biotechnology. Also, exhibit proficiency in performing experiments in the laboratory.

PSO2: Critical Thinking: Analyse complex problems, evaluate information, synthesize information, apply theoretical concepts to practical situations, identify assumptions and biases, make informed decisions and communicate effectively

PSO3: Problem Solving: Employ theoretical concepts and critical reasoning ability with biological and technical skills to solve problems, acquire data,analyse their biological significance and explore new design possibilities.

PSO4: Analytical & Scientific Reasoning: Apply scientific methods, collect and analyse data, test hypotheses, evaluate evidence, apply statistical techniques and use computational models.

PSO5: Research related skills: Formulate research questions, conduct literature reviews, design and execute research studies, communicate research findings and collaborate in research projects.

PSO6: Self-directed & Lifelong Learning: Set learning goals, manage their own learning, reflect on their learning, adapt to new contexts, seek out new knowledge, collaborate with others and to continuously improve their skills and knowledge, through ongoing learning and professional development, and contribute to the growth and development of their field.

FIRST YEAR - SEMESTER – I

CORE COURSE- I: CELL AND MOLECULAR DEVELOPMENTAL BIOLOGY

CO1 Have an insight of the cell as the fundamental unit of life and to compare the structure of the Eukaryotic cell with the primitive prokaryotic cell

CO2 Analyse the structure and obtain a strong foundation about the functional aspects of cell organelles and cell membrane.

CO3 Study the structure and functions of Nucleic acid and discuss the molecular mechanism of Replication, Transcription and Translation and post translational modifications of proteins.

CO4 Predict the response of cells to the intra and extracellular environment by studying about the intracellular signalling pathways.

CO5 Understand the principles and molecular mechanisms involved in cellular differentiation, morphogenesis, growth and Potency of the cell

ELECTIVE I- BIOLOGICAL CHEMISTRY

CO1 Comprehend the importance of Chemistry and Biochemistry through the concept of acids and bases, and chemical bonding.

CO2 Demonstrates the formation of different types of solutions, concentrations of solution sand preparation of buffer solutions

CO3 Recall the Structure, Classification, Chemistry and Properties of Carbohydrates and Explain Various Biochemical Cycles involved in Carbohydrate Metabolism.

CO4 Recall the Structure, Classification, Chemistry and Properties of Lipids, Nucleic acid and

Explain Various Biochemical Cycles involved in Fatty acid and Nucleic acid Metabolism.

CO5 Understand the Structure, Classification, Chemistry and Properties of proteins amino acids and identify and explain nutrients in foods and the specific functions in maintaining health.

SEMESTER – II

COURSE CORE III - GENETICS.

CO1 Learn about the classical genetics and transmission of characters from one generation to the next.

CO2 Obtain a strong foundation for the advanced genetics.

CO3 Explain the properties of genetic materials and storage and processing of genetic information.

CO4 Acquire knowledge about the Mutagens, Mutations, DNA Repairs and Genetic disorders in human.

CO5 Categories Eugenics, Euthenics and Euthenics and in-depth Knowledge on population Genetics

ELECTIVE II - FUNDAMENTALS OF MICROBIOLOGY

CO1 Understand the classification of Microorganisms and structure of bacteria

CO2 Understand the various microbiological techniques, different types of media, and techniques involved in culturing microorganisms.

CO3 Categorize the methods of sterilization and identify the significance of culture media in the growth of different microbes.

CO4 Exhibit knowledge in analysing the importance of Bio insecticides, Bio fertilizers prebiotics and probiotics.

CO5 Distinguish between normal flora and pathogens and describe the role of microbes in food intoxications**.**