SACRED HEART COLLEGE (AUTONOMOUS)

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Ready for Every Good Work

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Name of the Programme: M.Sc Bio chemistry

S No	Title of the Paper	Course Code	Course Objectives	Course Outcomes	Relevance
1	ELECTIVE – I – BIOINFORMATICS	BC712A	• To give focus on online resources in life sciences and applications of Bioinformatics in scientific research. • To determine the function of genes and proteins, to establish evolutionary relationships, and to calculate the three-dimensional shape of proteins by using computer programs. • To learn algorithms and statistics for assessing the	• Understand the history and basic concepts in bioinformatics. • Determine the formative databases available for all the biological macromolecules. • Analyze global and local sequence alignment tools and their importance. • List the various protein structure prediction methods through computational approaches. • Integrate the significance of gene prediction methods. • Evaluate the tools and software in the analysis of nucleic acid and protein.	**National developmental needs**

			• relationships among large sets of biological data. • To know the tools for the analysis and interpretation of the various biological data. • To understand various databases and learn the useful biological information.		
2	STEM CELL TECHNOLOGY	BC712C	• To learn about the basics of stem cells. • To understand the embryonic and adult stem cell therapy. • To examine the increasing potential of stem cell in medicine and understanding of the molecular determinants. • To develop the ability to understand the role of stem cells in research. • To learn about Stem cell based therapies in animal models.	• Enumerate the basics of stem cells and the concepts of embryonic and adult stem cell therapy. • Examine the increasing potential of stem cell science to contribute to medicine and understanding of the molecular determinants that define stem cells. • Demonstrate in vitro manipulation to create distinct cell lineages and understanding of the methodologies used for reverse engineering of mature cells to create induced pluripotent stem cells. • Compile the basic research methodologies used in current stem cell research. • Determine the ethical issues associated	**National developmental needs**

				• with stem cell research. • Defend the stem cell based therapies in animal models.	
3	RESEARCH METHODOLOGY	BC913	• To learn the Importance of Research and Ethics in Scientific research • To understand the collection and classification of research data. • To know the scope of Bioinformatics, the role of Computers in Biology and Useful search engines. • To acquire in-depth knowledge about the Laboratory animals used for Life science research. • To explain the Composition of the Institutional Ethical Committee (IEC) and General ethical issues.	• Observe the basic concepts of scientific research, types of research and research design. • Establish the knowledge about scientific writing and research publications • Generalise the Collection and Classification of Data and its analysis. • Perceive the Scope of Bioinformatics, and useful search engines for finding scientific articles. • Point out the Laboratory animals used for Life science research and its ethical issues. • Develop an understanding of the Composition of the Institutional Ethical Committee (IEC), IPR and Patenting.	**National developmental needs**

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4	ELECTIVE III - BIONANOTECHNOLOGY	BC914C	• To understand the fundamental principles of nanotechnology and its applications. • To study about the basic knowledge about nanoparticles and its biological applications. • To apply engineering concepts and demonstrate a comprehensive understanding of state-of-the-art nano- scale and nano-fabrication methods. • To evaluate the processing conditions to engineer functional nanomaterials. • To apply and transfer interdisciplinary approaches to bionanotechnology.	• Demonstrate the fundamental principles of nanotechnology and their application to biomedical engineering. • Exhibit the state-of-the-art nano-fabrication methods • Apply the knowledge of assessing nanomaterials and their safety • Make inferences on handling methods required during characterization • Justify the usage of nanomaterials in biological applications. • Compile the information about nanomedicines and their uses.	

5	BIOTECHNOLOGY	BC1010	- To impart knowledge on basic tools in genetic engineering. - To provide knowledge on cloning vectors and DNA sequencing. - To create awareness on gene transfer and its applications. - To understand basics on Industrial biotechnology. - To develop sound knowledge on Bio-safety and bio-hazards.	- Perceive a broad knowledge on gene transfer system, restriction enzymes and hybrid vectors in genetic engineering. - Explain the gene cloning technique, gene library, PCR and Blotting Techniques. - Outline the Tissue Culture, protoplast fusion, GM foods and xenografting. - Describe the basic concepts of fermentation and their industrial applications. - Determine the biological weapons, gene drain and tangled genes. - Interpretation of Vaccines with RNA virus and safety of GMOs	**National developmental needs**