

DEPARTMENT OF BIOTECHNOLOGY

Programme out come	Biotechnology is the broad area of biology involving living systems and organisms to develop or make products, or "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use". Depending on the tools and applications, it often overlaps with the (related) fields of molecular biology, bio-engineering, biomedical engineering, bio manufacturing, molecular engineering etc.
Programme specific out come	The course encompasses a wide range of procedures for modifying living organisms according to human purposes, like to domestication of animals, cultivation of the plants, culturing of microorganisms and "improvements" of these through breeding programs that employ artificial selection and hybridization. Modern usage also includes genetic engineering as well as cell and tissue culture technologies and strain improvement. the course also includes related subjects like immunology, industrial biotechnology etc.
	BSc Biotechnology -Course out come
Course	Outcome
Cell Biology and Cytogenetic	the course outcome is-understanding the history of cytology and draw the structure of cell organelles and locate its parts along with functions. Distinguish the structure of prokaryotic and eukaryotic cell. Explain the organization of Genes and chromosomes, chromosome morphology and its aberrations Compare and contrast the events of cell cycle and its regulation
Biochemistry	The course outcome is-understanding structure, properties, functions of bio molecules like carbohydrates ,lipids ,protein and nucleic acids mechanism of action of enzymes. Fundamentals of enzyme structure and function and kinetics of enzymes and immobilized enzymes. Discussion on current applications and future potential of enzymes. Illustrate the metabolism of carbohydrates through various anabolic and catabolic pathways like glycolysis, Kerb's cycle. Introduction to diverse tools, techniques, methods and protocols that are basic to the biochemical understanding of life. Providing hands-on-training in several basic

	experiments in biochemistry. Exposure to sophisticated instruments.
Microbiology and Immunology	<p>Understand the basic microbial structure and functions of various physiological groups of prokaryotes and eukaryotes and theory and practical skills in microscopy handling and staining techniques. various Culture media, means of sterilization and also learn various techniques for isolation of pure culture . Physical and Chemical growth requirements of bacteria .</p> <p>Understanding landmarks in the field of immunology and various scientists of the field. Components of the immune system and how cells and organs play an important role in the immune responses. specific interactions of Antigens and antibodies and the diversity of antibodies. Knowledge of molecular mechanisms and kinetics of the immune responses, both humoral and cell mediated immunity. Hypersensitive reactions and autoimmune diseases.various immuno techniques.</p>
Molecular biology	<p>Understand different steps in the central dogma of molecular biology, enzymes involved in synthesis of DNA, RNA and protein. Learn the basic steps involved in DNA replication in prokaryotes and eukaryotes, emphasizing the enzymes involved in different types of replication. Understand and explain the different damages caused to DNA, the mechanisms involved in repairing DNA and DNA repair defects diseases. Understand the purpose of the cells performing transcription and translation, learning steps involved in gene expression. Understanding transposons.</p>
Genetic engineering	<p>Gain knowledge about Recombinant DNA technology by studying about various Vectors and Restriction Enzymes involved. Study of Various Expression Systems and Molecular Markers .Isolation of Genomes Application of R-DNA technology and use of Restriction enzymes in construction of various. Vectors and libraries such as c-DNA & Genomic libraries Screening of the libraries and Molecular Markers.</p>
Plant and	Gain knowledge about Laboratory organization, culture media, callus

<p>animal biotechnology</p>	<p>culture, suspension culture, Assessment of growth and viability, Micro propagation, Somatic embryogenesis, synthetic seed. Meristem culture, Somaclonal variations, haploid plants. Protoplast culture, somatic hybridization. Agro bacterium mediated transformation. Plant cell as bio factories for the production of Secondary metabolites. History, scope, principle, merits and demerits of animal cell and tissue culture. Laboratory facilities and culture media for animal tissue culture. Cell lines, application of animal cell and tissue culture, biohazards and Bio safety. Transgenic animals, Economic aspects of transgenic animals.</p>
<p>Agriculture and environment biotechnology</p>	<p>Gain knowledge about plant breeding, Symbiotic-Non symbiotic nitrogen fixation in Leguminous plant. Bio fertilizer, bio pesticides, bio insecticide. Germplasm conservation and cryopreservation. Plant growth regulators. Solid Waste Management, Waste water management ,Air pollution management Bioremediation, Biodegradation, Bio fuels: Advantages , Energy from biomass, Biogas, Bio hydrogen, Bio safety and EPA</p>
<p>Industrial and medical biotechnology</p>	<p>Insight into the principles of pathogen city and virulence by microbes. Understand quantitative measures of virulence and several parameters that relates to human diseases. Gain knowledge of various human pathogens, their mechanism of action and adaptation. Diagnostic procedures, new vaccines and mechanism of antibiotic resistance Basic of bioprocess technology, concept and significance of bioprocess technology. Concept of bioreactor, designing of fermented and types of fermentation. Screening of microorganisms, storage and preservation of industrially important. Microorganisms Concept and types of strain improvement techniques Fermentative productions of representative bio molecules like Enzymes, antibiotics, vitamin, beverages, Recovery and purification of bio molecules.</p>