

Semester	II
Course ^{*1}	Multi Dis-2
Paper Title	Introduction to 'Central Dogma of Life'
Paper Code	M1BT230211P
No. of Credits ^{*2}	3
Theory / Practical / Composite	Practical
Minimum No. of preparatory hours per week a student has to devote	3
Number of Modules	1
Syllabus	<p>Definition of Biotechnology Structural & Functional Unit of a Living Object – A Cell: components & management – analogy with a corporate house Practical: Microscopic observation of cells</p> <p>Central Dogma Chemistry of the Cell – biological Macromolecules: (a) DNA, RNA, Proteins, Lipids with special reference to biological membrane, & Carbohydrates Practical: SDS-PAGE, Agarose gel electrophoresis Preparation of buffers. Determination of buffering capacity of amino acids (b) Wonder molecule of the cell – Enzymes: a special mention of their superiority over inorganic catalysts Practical: Enzyme assay</p> <p>Recombinant DNA Technology (RDT) – an outcome of accumulated basic knowledge in Cellular Biochemistry: (a) Basic protocol (b) Applications – overproduction of commercially important substances Practical: Blue-white screening to distinguish recombinant and non-recombinant DNA</p> <p>Biotechnology with whole microbial cells and enzymes – immobilization technique</p> <p>Future Prospects: (a) Without disturbing the ecological balance how we can bring nutritious food to the mouth of every living object on our planet earth. (b) How we can alleviate the suffering of people affected with various diseases.</p>
Learning Outcomes ^{*3}	<ol style="list-style-type: none"> 1. Acquiring a basic idea as to what 'Biotechnology' as a subject is. 2. Getting acquainted with a concept of biological 'cell', the basic structural and functional unit of life. 3. Developing the understanding of the chemical reactions that take place in living cells.

	<ol style="list-style-type: none"> 4. Understanding the concept of pKa values of the amino acids which are essential for understanding many fundamental reactions in chemistry. 5. Gaining a fundamental concept on “Central Dogma of Life”, which is conventionally regarded as the ‘flow of genetic information from DNA to RNA to proteins’, as proposed by Nobel Laureates Watson & Crick. 6. Gaining a comprehensive idea about the different cellular biomolecules and their basic chemistry. 7. Acquisition of a basic understanding of ‘enzymes’- the cellular biocatalysts. 8. Gaining an overview of the basics of Recombinant DNA Technology (RDT) – the approaches to genetic engineering and overproduction of commercially valuable substances. 9. Being familiarized with fundamental Practical modules on all these basic topics.
Reading/Reference Lists * ⁴	
Evaluation [50 marks]	Practical CA: 48 marks Continuous Assessment [Assessment modalities will be declared in due course by the Course Instructors] Attendance: 2 marks