B.Tech Biotechnology: Semester-I BBT-104 - Introduction to Biotechnology	
Teaching Scheme	**Examination Scheme**
Lectures: 2 hrs/Week	
Tutorials: 1 hr/Week	Internal Marks : 25 Marks
Credits: 3	End Semester Exam: 50 Marks

Course Objectives:

- To give an overview of biomolecules and their significance. To give basic knowledge of Structure, biosynthesis and function of Macromolecules (Carbohydrates, Proteins and Lipids).
- To have an overview of Microorganism: Origin of microbiology, Types of microbes, Classification of microbes.
- To explain about the Introduction Genes & Genome.
- To explain the Bioinformatics, Biological databases (nucleotide and Protein Databases, Structure databases).
- To explain the Human Health & Hygiene: Population and birth control, sexually transmitted diseases.

Course outcomes:

CO1: To define the basicScience and biotechnology, basic principles of Biomolecules and their brief introduction -Carbohydrates, Proteins and Lipids.DNA and RNA

CO2: To summarize the different types of Origin of microbiology, Types of microbes, Classification of microbes, macro and micro molecules required for growth of microorganism

CO3: To determineProperties of Tools and Techniques: Brief Concept, types and applications of Chromatography, spectrophotometry, Electrophoresis and PCR

CO4: compare Introduction to Genes & Genome, Human Genome Project.

Enzymes: History, Nomenclature & Classification of Enzymes and its function

CO5: To judge the significance of various Media: defined and undefined, Study of Microbes (culture techniques and staining method)

CO6: To create a model on. Introduction to Recombinant DNA technology:Restrictionenzymes,vectors, how to isolate and clone a desired gene, Applications of RDT

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UNIT –I Introduction to Biotechnology
Introduction to Biotechnology Fundamentals of Biochemical Engineering, Biotechnology and Society. Principles and Processes; Application in Health, food, medicine and Agriculture; genetically modified (GM)organisms; biosafety issues. **Biomolecules** Building Blocks of Biomolecules-Structure and dynamics. Structure and function of Macromolecules (Carbohydrates, Proteins ,Lipids). Classification of Enzymes; Purification and characterization of enzymes from natural sources. Comparison of chemical and enzyme.
UNIT- II Cell as a basic unit of life
Cell as a basic unit of life. Introduction: Definition, Study of Microbes, Types of microbes, Classification of microbes. Origin of microbiology. Application of microbes in fermentationBiotechnology. Cellular Techniques including chromatography.
UNIT- III Biological databases
History of Bioinformatics. Introduction and application. Biological databases (nucleotide andprotein data bases, Structure databases) and their retrieval.. Sequence file formats .information Sources Analysis using Bioinformatics tools. **Genomics:** Introduction Genome Sequencing Projects, Gene Prediction and counting,Genome similarity, SNP's and comparative genomics.

Suggested Readings

- B.D.Singh,"Biotechnology " (Kalyani Publishers)
- R.C.Dubey, "Text book of Biotechnology" (S.Chand and company)
- William J. Thieman ," Introduction to Biotechnology", Michael A. Palladino, Publisher: Benjamin
- Cummings
- Colin Ratledge," Basic Biotechnology Publisher": Cambridge University Press

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