

B. Sc. Biotechnology: Semester-III BST 301 : Molecular Biology	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1hrs/Week Credits: 4	Examination Scheme Class Test -12Marks Teachers Assessment - 6Marks Attendance - 12 Marks End Semester Exam - 70 marks

Prerequisite: - BST 103 Cell Biology and BST 102 Introduction to Biotechnology, BST152 Biotechnology Lab

Course Objectives:

1. To give overview of concept of gene and chromosomes
2. To give complete knowledge of structure of DNA , Bacterial Chromosomes and Extra-chromosomal DNA, Organelles of Eukaryotic Cells Contain DNA, DNA Supercoiling
3. To describe Structure of DNA, Watson & Crick's Model, Types of DNA, Meselson and Stahl's experiment, DNA replication with Enzymes and Protein factors in DNA Replication, genome complexity
4. To explain the DNA Dependent synthesis of RNA, RNA Polymerases, Structure and types of RNA and their functions
5. To explain the Genetics code, Protein synthesis: Ribosomes, tRNA, Aminoacyl-tRNA Synthetases
6. Genetic recombination, Molecular aspects of recombination, Homologous and heterologous recombination

Course Outcomes:

After completing the course, students will be able to:

- CO1: Understand and apply the principles and techniques of molecular biology which prepares students for farther education and/or employment in teaching, basic research, or the health professions
- CO2: Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
- CO3: Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems
- CO4: Students will be able to clearly communicate the results of scientific work in oral, Written and electronic formats to both scientists and the public at large
- CO5: Students will be able to explore new areas of research in both molecular biology and Allied fields of science and technology
- CO6: Research Development and Practice that is Formulate and carryout independent and collaborative research projects

Head

Department of Biotechnology
Invertis University, Bareilly (U.P.)

Dean
Faculty of Science
Invertis University, Bareilly (U.P.)

Registrar
Invertis University
Bareilly

CO7: Students will be able to develop the communication skills in presenting their research findings through effective oral and written presentations.

Detailed Syllabus:

UNIT-1

Genes and Chromosomes: Structure of DNA, Bacterial Chromosomes and Extra-chromosomal DNA, Organelles of Eukaryotic Cells Contain DNA, DNA Super-coiling, Chromatin and Nucleoid Structure, DNA as the genetic material Hershey and Chase experiment, Conrat and Singer's experiment, Watson & Crick's Model, Types of DNA, Meselsen & Stahl's experiment, Enzymes and Protein factors in DNA Replication, genome complexity

UNIT-2

DNA Dependent synthesis of RNA, RNA Polymerases, Structure and types of RNA and their functions, Basic Concept of RNA Processing, Transcription in prokaryotes and eukaryotes, Steps in transcription,

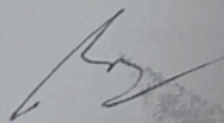
Translation; Genetics code, Protein synthesis: Ribosomes, tRNA, Aminoacyl-tRNA Synthetases, Comparison between prokaryotic and eukaryotic translation, Post translational processing of proteins in Eukaryotes and Prokaryotes

UNIT-3

Genetic recombination: Molecular aspects of recombination, Homologous and Heterologous recombination. Holliday Model, Gene regulation: principles of gene expression, Gene regulation in mitochondrion and chloroplast, Regulation of gene expression in prokaryotes and Eukaryotes, Operon concept - details of lac and tryp operon

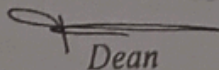
Text and Reference Books

1. Molecular Biology of the Gene -Lewin
2. Molecular biology JD Watson.



Head

Department of Biotechnology
Invertis University, Bareilly (U.P.)



Dean

Faculty of Science
Invertis University, Bareilly (U.P.)



Registrar
Invertis University
Bareilly