

TEACHING PLAN 2025-2026 (ODD SEMESTER)

Name :-ANURADHA

Department:-BIOTECHNOLOGY

Class:- BSc biotech fifth semester

Sub:- GENOMICS AND PROTEOMICS

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
Month 1	Introduction on syllabus And basics about genomics	History of Genomics and conceptual methods on Genomics	ABOUT GENOMIC BASIC CONCEPTS DNA SEQUENCING METHOD	MAXAM AND GILBERT METHOD SANGER METHOD	
Month 2	CHAIN TERMINATION METHOD	AUTOMATED DNA SEQUENCING METHOD REVISION	PYROSEQUENCING GENOME SEQUENCING METHOD	SHOTGUN METHOD HIERARCHICAL METHOD	

Month 3	COMPUTER TOOLS FOR SEQUENCING PROJECTS	GENOME SEQUENCING SOFTWARE	MANAGING AND DISTRIBUTING GENOME DATA	WEB BASED SERVER SOFTWARE FOR GENOME ANALYSIS ENSEMBEL	VISTA
Month 4	UCSC GENOME BROWSER	NCBI GENOME BROWSER SELECTED MODEL ORGANISMAL GENOMES	SDS PAGE ORGANISM DATABASE PROTEIN STRUCTURE AND CHEMICAL AND PHYSICAL PROPERTIES	PHYSICAL INTERACTIONS OF PROTEINS	SEDIMENTATION ANALYSIS NATIVE PAGE
Month 5	EDMAN DEGRADATION PROTEOMICS	2 D PAGE MASS SPECTROMETRY	DE NOVO SEQUENCING METHOD	REVISION AND EXAM PREPERATION	

Teacher Signature

TEACHING PLAN 2025-2026(ODD SEMESTER)

Name :-ANURADHA

Department:BIOTECHNOLOGY

Class:- BSc biotech first semester

Sub:- CELL BIOLOGY

Month	1 st Week	2 nd Week	3 rd Week	4 th Week	5 th Week
Month 1	Introduction of syllabus	About cell and it's characteristic	CLASSIFICATION OF ORGANISM BY CELL STRUCTURE	DIFFERENCE BETWEEN PROKARYOTES AND EUKARYOTES COMPARTMENTALIZATION OF EUKARYOTIC CELL	CELL MEMBRANE
Month 2	CHEMICAL COMPONENT OF CELL MEMBRANE	CHEMICAL COMPONENT OF CELL MEMBRANE ORGANIZATION OF CELL MEMBRANE FLUID MOSAIC MODEL	DYNAMIC ENTITY OF MEMBRANE CELL RECOGNITION MEMBRANE TRANSPORT MICROTUBULE	MICROTUBULE STRUCTURE AND FUNCTIONS MICROFILAMENTS INTERMEDIATE FILAMENTS	ENDOPLASMIC RETICULUM GOLGI COMPLEX

Month 3	BIOGENESIS OF GOLGI COMPLEX FUNCTION INCLUDING ROLE IN PROTEIN SECRETIONS	VACUOLES MICROBODIES RIBOSOMES	MITOCHONDRIA STRUCTURE, FUNCTIONS AND BIOGENESIS CHLOROPLAST STRUCTURE, FUNCTION AND BIOGENESIS	NUCLEUS STRUCTURE CHROMATIN CHROMOSOMES	REVISION
Month 4	CELL CYCLE INTERPHASE M PHASE	MITOSIS MEIOSIS REGULATION OF CELL CYCLE	REGULATION OF CELL CYCLE CELL ADHESION MOLECULES	MEMBRANE RECEPTORS REGULATION AND FUNCTION OF RECEPTOR EXPRESSION	Revision
Month 5	Structure of Bacteria	Functions of Bacteria REVISION	Components of Bacteria in detail	REVISION AND EXAM PREPERATION	

TEACHING PLAN 2025-26 (ODD SEMESTER)
(JULY 2025 to DECEMBER 2025)

Name :- Dr. Maryada Garg
Subject:- MDC : Biotechnology for Society
Subject Code: 24CBTX01MD01

Department:-Biotechnology
Semester:1

Month	1st Week	2nd Week	3rd Week	4th Week	5 th week
1ST MONTH	Day I:- (2.7.18) ----- <u>ADMISSIONS</u>	Day I:- ----do----	Day I:- Introduction to Biotechnology	Day I:- Definition of biotechnology	Day I:- : proteins,
	Day II:- ---do-----	Day II:- -----do-----	Day II:- Importance and applications of biotechnology	Day II:- Historical Importance of biotechnology	Day II:- TEST
	Day III:- ----do-----	Day III:- ----do-----	Day III:- Discuss application of biotechnology in various sectors.	Day III:- Biomolecules	Day III:- Nucleic acids: DNA structure
2nd MONTH	Day I:- Nucleic acids: DNA functions	Day I:- Carbohydrates: structure	Day I:- Lipids: structure and importance	Day I:- Enzymes and their applications in biotechnological processes.	Day I:- Test
	Day II:- Nucleic acids: RNA structure	Day II:- Carbohydrates: function	Day II:- Lipids: structure and importance	Day II:- Enzymes and their applications in biotechnological processes.	Day II:- Seminar
	Day III:- Nucleic acids: RNA functions	Day III:- Test	Day III:- <u>TEST</u>	Day III:- <u>REVISION</u>	Day III:- DNA as genetic material, , ,
3rd MONTH	Day I:- REVISION	Day I:- REVISION	Day I:- DNA structure revision	Day I:- Test of Unit I	Day I:- Basic steps of cloning and applications
	Day II:- DNA as a double helix	Day II:- Genetic code,	Day II:- Translation	Day II:- Test of Unit II	Day II:- Basic steps of cloning and applications
	Day III:- RNA structure,	Day III:- Transcription	Day III:- Test	Day III:- Practical discussion	Day III:- Seminar
4th MONTH	Day I:- Biotechnology in day to day life.	Day I:- Microbial products (Fermented milk products)	Day I:- Animal products (growth factors)	Day I:- Test	Day I:- Ethical aspects of Biotechnology Research.
	Day II:- GANDHI JAYANTI	Day II:- Animal products (insulin)	Day II:- Plant products (Bt cotton)	Day II:- Biotechnology role in human health	Day II:- Test

	Day III:- Microbial products (Beverages)	Day III:- <u>DISCUSSION</u>	Day III:- and plant products (Golden rice)	Day III:- <u>TEST</u>	Day III:- Seminar
5th MONTH	Day I:- Legal aspects of Biotechnology Research.	Day I:- Social aspects of Biotechnology Research.	Day I:- Previous year question paper discussion.	Day I:- Completion of practical records	Day I:- Doubt clearance
	Day II:- Discussion of syllabus	Day II:- Discussion of syllabus	Day II:- Test	Day II:- ----do---	Day II:- Doubt clearance
	Day III:- <u>TEST</u>	Day III:- <u>TEST</u>	Day III:- Seminar	Day III:- ----do--	Day III:- Practical completion

Teacher Signature

TEACHING PLAN 2025-26 (ODD SEMESTER)
(JULY 2025 to DECEMBER 2025)

Name : Dr. Maryada Garg

Subject:- Basics in Biotechnology (MINOR)

Subject Code: 24CBT401MI01

Department:-Biotechnology

Semester:1

Month	1st Week	2nd Week	3rd Week	4th Week	5th week
1ST MONTH	Day I:- (2.7.18) ----- <u>ADMISSIONS</u>	Day I:- ----do----	Day I:- Introduction to Biotechnology	Day I:- Definition of biotechnology	Day I:- Biotechnology – an interdisciplinary pursuit.
	Day II:- ----do-----	Day II:- -----do-----	Day II:- Importance and applications of biotechnology	Day II:- Historical Importance of biotechnology	Day II:- TEST
	Day III:- ----do-----	Day III:- ----do-----	Day III:- Discuss application of biotechnology in various sectors.	Day III:- Biomolecules	Day III:- Biotechnology research in India
2nd MONTH	Day I:- Public perception of biotechnological products	Day I:- : Immune system (immune cells)	Day I:- General structure of immunoglobulins.	Day I:- Hybridoma technology	Day I:- Test
	Day II:- Biotechnology in context of developing world	Day II:- Types of immunity	Day II:- Lipids: structure and importance	Day II:- Monoclonal antibodies	Day II:- Seminar
	Day III:- Brief account of Immunotechnology.	Day III:- Test	Day III:- <u>TEST</u>	Day III:- <u>REVISION</u>	Day III:- In vitro fertilization
3rd MONTH	Day I:- REVISION	Day I:- REVISION	Day I:- Concept of proteome	Day I:- Test of Unit I	Day I:- DNA fingerprinting
	Day II:- Embryo transfer technology.	Day II:- : Concept of Gene	Day II:- and history and overview of genetic manipulations.	Day II:- Test of Unit II	Day II:- Forensic analysis
	Day III:- Introduction of genetic engineering proteins.	Day III:- : Concept of genomes.	Day III:- Test	Day III:- Practical discussion	Day III:- Seminar

4th MONTH	Day I:- Biotechnology in day to day life.	Day I:- Environmental Biotechnology: An overview.	Day I:- Brief account on bioremediation	Day I:- Test	Day I:- Ethical aspects of Biotechnology Research.
	Day II:- GANDHI JAYANTI	Day II:- Scope and market of biological control of environment.	Day II:- Waste treatment biotechnology.	Day II:- Biotechnology role in human health	Day II:- Test
	Day III:- Microbial products (Beverages)	Day III:- <u>DISCUSSION</u>	Day III:- Waste treatment biotechnology.	Day III:- <u>TEST</u>	Day III:- Seminar
5th MONTH	Day I:- Waste treatment biotechnology revision	Day I:- Social aspects of Biotechnology Research.	Day I:- Previous year question paper discussion.	Day I:- Completion of assignments (if any)	Day I:- Doubt clearance
	Day II:- Discussion of syllabus	Day II:- Discussion of syllabus	Day II:- Test	Day II:- ----do---	Day II:- Doubt clearance
	Day III:- <u>TEST</u>	Day III:- <u>TEST</u>	Day III:- Seminar	Day III:- ----do--	Day III:- Assignment and seminar completion (if any is left)

TEACHING PLAN 2025-26 (ODD SEMESTER)
(JULY 2025 to DECEMBER 2025)

Name : Dr. Maryada Garg

Subject:- Principles of Gene Manipulation (MINOR)

Subject Code: 24CBT402MI01

Department:-Biotechnology

Semester:III

Month	1st Week	2nd Week	3rd Week	4th Week	5 th week
1ST MONTH	Day I:- (2.7.18) ----- <u>ADMISSIONS</u>	Day I:- ----do----	Day I:- Introduction to Biotechnology	Day I:- Genetic Engineering: Introduction.	Day I:- , Purification of total cell DNA.
	Day II:- ----do-----	Day II:- -----do-----	Day II:- Importance and applications of biotechnology	Day II:- Scope of genetic engineering.	Day II:- TEST
	Day III:- ----do-----	Day III:- ----do-----	Day III:- Discuss application of biotechnology in various sectors.	Day III:- Milestones in genetic engineering.	Day III:- , Purification of plasmid DNA
2nd MONTH	Day I:- DNA Yield analysis	Day I:- Polynucleotide kinase,	Day I:- Alkaline phosphatase,	Day I:- Methylase	Day I:- Test
	Day II:- Nucleic acids: RNA and DNA structure	Day II:- DNA polymerase,	Day II:- Nucleases	Day II:- Enzymes and their applications in biotechnological processes.	Day II:- Seminar
	Day III:- Nucleic Acid Modifying Enzymes:	Day III:- Test	Day III:- <u>TEST</u>	Day III:- <u>REVISION</u>	Day III:- Reverse transcriptase
3rd MONTH	Day I:- REVISION	Day I:- REVISION	Day I:- DNA structure revision	Day I:- Test of Unit I	Day I:- DNA fingerprinting,
	Day II:- Restriction endonucleases,	Day II:- Genetic code,	Day II:- Transformation, Gene transfer using plasmids.	Day II:- Test of Unit II	Day II:- Gene therapy.

	Day III:- Ligases.	Day III:- Gene Recombination and Gene Transfer: Construction of recombinant DNA, Preparation of competent cells,	Day III:- Test	Day III:- Practical and assignment discussion	Day III:- Seminar
4th MONTH	Day I:- Biotechnology in day to day life.	Day I:- Application of Genetic Engineering.	Day I:- Genetic engineering in plants	Day I:- Test	Day I:- Ethical aspects of Biotechnology Research.
	Day II:- GANDHI JAYANTI	Day II:- Genetic engineering in animals	Day II:- Plant products (Bt cotton and golden rice)	Day II:- Biotechnology role in human health	Day II:- Test
	Day III:- Application of Genetic Engineering.	Day III:- <u>DISCUSSION</u>	Day III:- Animal products made by the use of biotechnology.	Day III:- <u>TEST</u>	Day III:- Seminar
5th MONTH	Day I:- Therapeutic products produced by Genetic engineering	Day I:- Immune modulators	Day I:- Previous year question paper discussion.	Day I:- Completion of practical records	Day I:- Doubt clearance
	Day II:- Human hormones	Day II:- Vaccines	Day II:- Test	Day II:- ----do---	Day II:- Doubt clearance
	Day III:- <u>TEST</u>	Day III:- <u>TEST</u>	Day III:- Seminar	Day III:- ----do--	Day III:- Practical completion

Teacher Signature

TEACHING PLAN 2025-26 (ODD SEMESTER)
(JULY 2025 to DECEMBER 2025)

Name :- Dr. Maryada Garg

Department:-Biotechnology

Sub:- Bioinformatics. (BT-501) OLD SCHEME

Month	1st Week	2nd Week	3rd Week	4th Week	5 th week
1st MONTH	<u>ADMISSIONS</u>		Introduction to Bioinformatics/ History. EMBL/GENBANK	Entrez Unigene	Understanding the structure of each source and using it on the web_ Practical.
2nd MONTH	PRACTICAL	Protein information sources. PDB	TREMBL	PRACTICAL	PRACTICAL CONTD...
3rd MONTH	Restriction digestion.	SWISSPROT.	Chromatograms.	Blots/PCR	Microarrays.

4th MONTH	Mass spectrometry.	Test and previous revisions. Sequence and phylogenetic analysis. <u>TEST</u>	ORF Mutation/Substitution matrices.	BLAST. Pairwise alignments.	FASTA
					Gene identification tools .
5th MONTH	<u>TEST AND REVISION</u>	Pattern and repeat finding. Revisions.	REVISIONS/TEST/ DISCUSSION/PREVIOUS PAPER DISCUSSION	REVISIONS/TEST/DISCUSSION/PREVIOUS PAPER DISCUSSION	REVISIONS/TEST/DISCUSSION/PREVIOUS PAPER DISCUSSION

Teacher Signature

**TEACHING PLAN 2025-26 (ODD SEMESTER)
(JULY 2025 TO NOV 2025)**

Name : Dr. Shalini Malhotra

Basisc of Biomolecules

Department: Biotechnology

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
August	Carbohydrates: Structure and Function : Structure and properties of Monosaccharides.	Oligosaccharides and Polysaccharides:Structure and Properties	Homo & Hetero Polysaccharides.	Mucopolysaccharides, Glycoprotein's and their biological functions.	
September	Amino acids & Proteins: Structure & Function. Structure and properties of Amino acids, Types of proteins and their classification.	Classification by R group, Zwitterion structures, Acid base properties,	Titration curve of amino acids, Essential amino acids, Physiochemical properties of amino acids	Basic introduction to terms:Motifs and Domains, Forces that stabilise the protein structure.	Electrostatic forces, Hydrogen and Disulphide bonds.

October	Protein structure and shape. Different Level of structural organization of proteins.	Structure and functions – Classification, structures, nomenclature and properties of fatty acids, essential fatty acids.	Diwali Break	Phospholipids structure and properties of different types of phospholipids, sphingomyelins, glycolipids, cerebroside, gangliosides,	Prostaglandins, Terpenoids and Isoprenoids, Steroids
November	Concept of Acid Value, Saponification Value and Iodine value	Nucleic acids: Chemical structure and Base Composition of Nucleic acids. Chargaff's Rule	Watson Crick Model (B DNA and other forms of DNA(A and Z DNA)	Nucleotides and Nucleosides, Biologically important nucleotides.	Types and Structure of RNA, Denaturation and Renaturation of DNA.

Teacher Signature

**TEACHING PLAN 2025-26(ODD SEMESTER)
(JULY 2025 TO NOV 2025)**

Name : **DR. Shalini Malhotra**

RDT

Department:Biotechnology

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
JULY			Gene Recombination and Gene transfer.	Bacterial Conjugation, Transformation, Transduction, Episomes, Plasmid.	Microinjection, Electroporation
AUG	Microprojectile, Shot Gun method, Ultrasonication. Liposome fusion,	Microlaser. Liposome fusion, Microlaser.	Changing genes: site-directed mutagenesis and Protein engineering: Primer extension is a simple method for site directed mutation.	PCR based site directed mutagenesis, Random mutagenesis.	Use of Phage display techniques to facilitate the selection of mutant peptides.

SEPTEMBER	Genetic engineering in animals: Production of transgenic mice, , Transgenic animals,	ES cells can be used for gene targeting in mice, Applications of gene targeting.	Therapeutic products produced by genetic engineering-blood proteins.	Human hormones, immune modulators and vaccines,	Test
OCTOBER	Production of proteins of Pharmaceutical value.	Genetic engineering in plants: Use of Agrobacterium tumefaciens and Arhizogenes,	Diwali Break	Ti plasmids, Strategies for gene transfer to plant cells.	Direct DNA transfer to plants.
NOVEMBER	Gene targeting in plants, Use of plant viruses as episomes.	Using Yeast to study Eukaryotic gene function,	Gene shuffling, production of chimeric proteins.	Revision and Test	Discussion of Sample papers

Teacher Signature

TEACHING PLAN 2019-20 (ODD SEMESTER)
(JULY 2019 TO NOV 2019)

Name : Dr. Shalini Malhotra

Immunology

Department: Biotechnology

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
JULY			Immune Response - An overview, components of mammalian immune system, T-lymphocytes & immune response.	molecular structure of Immunoglobulins or Antibodies, Humoral & Cellular immune responses,	cytotoxic T-cell, helper T-cell, suppressor T-cell.
AUG	T-cell receptors, genome rearrangements during B-lymphocyte differentiation.	Antibody affinity maturation class switching, assembly of T-cell receptor genes by somatic recombination.	Regulation of immunoglobulin gene expression – clonal selection theory., genetic basis of antibody diversity, hypotheses (germ line & somatic mutation), antibody diversity.	Allotypes & idiotypes, allelic exclusion, immunologic memory.	Heavy chain gene transcription
SEPTEMBER	Major Histocompatibility complexes – class I & class II MHC antigens. antigen processing.	Immunity to infection – immunity to different organisms, pathogen	Defense strategies, avoidance of recognition.	Autoimmune diseases, Immunodeficiency-AIDS.	Test
OCTOBER	Vaccines & Vaccination –recombinant vaccines	Adjuvants, cytokines, DNA vaccines,	Bacterial vaccines, viral vaccines,	Vaccines to other infectious agents, passive & active immunization.	Diwali Vacation

NOVEMBER	Introduction to immunodiagnostics —.	RIA, ELISA.	Revision and Test.	Revision and Test	
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Teacher Signature