

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher –Dr. Preeti Sharma

Class – B.Sc. Biotechnology, Sem- V

Subject– Immunology

Paper–B23-BTY-501

August, 2026 1 st Week 1 Aug	Syllabus and Time-Table discussion
2 Aug, 2026	Sunday
2 nd Week 6, 7, 8 Aug	Introduction and overview of Immunology, Cells and organs of the Immune system
9 Aug, 2026	Sunday
3 rd Week 13, 14 Aug	Primary and secondary responses Innate immunity: anatomic, physiological, phagocytic and inflammatory barriers
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 20, 21, 22 Aug	Adaptive Immunity: Humoral and cell-mediated. Inter-relationship between innate and acquired immunity
23 Aug, 2026	Sunday
5 th Week 27, 29 Aug	Concept of antigenicity and immunogenicity. Antigens, epitopes, haptens and adjuvants. Basic structure of antibodies
28Aug, 2026 30Aug, 2026	RakshaBandhan Sunday

September, 2026 1st Week 3, 5 Sept	Antibody classes and their biological activity, Antigenic determinants on Immunoglobulins, Immunoglobulin super family.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 10, 11, 12 Sept	Antigen-antibody interactions immune-precipitation, agglutination B-cell receptor-structure and function, T-cell receptor
13 Sept , 2026	Sunday
3rd Week 17, 18, 19 Sept	Introduction of self-tolerance and MHC-restriction Structure and Role of Major Histo-compatibility Complex
20 Sept, 2026	Sunday
4th Week 24, 25, 26 Sept	Antigen processing and presentation, Complement system and its activation pathways
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday

October, 2026 1st Week 1, 3 Oct	Cytokines and their role
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 8, 9, 10 Oct	Hypersensitivity reactions-their types and mechanism.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 15, 16, 17 Oct	Autoimmune disorders
18 Oct, 2026	Sunday
4th Week 22, 23, 24 Oct	Passive and active immunization
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 29, 30, 31 Oct	Revision

November, 2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov-14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 19, 20, 21 Nov	Hybridoma Technology: production of monoclonal antibodies.
22 Nov, 2026	Sunday
4th Week 26, 27, 28 Nov	Vaccines: live attenuated, killed, subunit, conjugate and DNA vaccines.
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
December, 2026 1st Week 3, 4 Dec	Revision + Class Test
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher–Dr. Preeti Sharma

Class – M.Sc. Biotechnology, Sem- III

Subject– Immunology

Paper–M24-BTY-305

August, 2026 1 st Week 1 Aug	Introduction and overview of Immunology
2 Aug, 2026	Sunday
2 nd Week 3, 5, 7, 8 Aug	Cells of the Immune system, Innate and cellular immunity.
9 Aug, 2026	Sunday
3 rd Week 10, 12, 14 Aug	Physical and chemical barriers, cellular defenses, inflammation
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 17, 19, 21, 22 Aug	Receptors involved in innate immune system, cells and organs involved in adaptive immune response
23 Aug, 2026	Sunday
5 th Week 24, 26, 29 Aug	Fate of antigen after penetration, interrelationship between innate and acquired immunity
28 Aug, 2026 30 Aug, 2026	Raksha Bandhan Sunday
31 Aug, 2026	Requirements of Immunogenicity

September,2026 1 st Week 2, 5 Sept	Primary and secondary responses. Major classes of antigens
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2 nd Week 7, 9, 11, 12 Sept	Basic structure of antibodies, Antibody classes and biological activity, Antigenic determinants on Immuno-globulins, Immunoglobulin super-family.
13 Sept , 2026	Sunday
3 rd Week 14, 16, 18, 19 Sept	Organization and expression of Immunoglobulin genes. Antigen-antibody interactions immune-precipitation, agglutination
20 Sept,2026	Sunday
4 th Week 21, 23, 25, 26 Sept	ELISA, Immuno-fluorescence, Flow cytometry Complement system and its activation, structure and role of Major histo-compatibility complex
23 Sept,2026 27 Sept,2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5 th Week 28, 30 Sept	T-cell receptor-structure, complex and accessory membrane molecules Thymic selection of T-cells,

October, 2026 1 st Week 3 Oct	T-Cell activation and differentiation,
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2 nd Week 5, 7, 9, 10 Oct	B-cell maturation, activation and proliferation, humoral response Cytokines-properties and receptors
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3 rd Week 12, 14, 16, 17 Oct	Hypersensitivity reactions-their types and mechanism,
18 Oct, 2026	Sunday
4 th Week 19, 21, 23, 24 Oct	Cancer and the immune system, Cancer immunotherapy.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5 th Week 28, 30, 31 Oct	Revision.

November,2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov-14 Nov	Sessional Exams
15 Nov,2026	Sunday
3rd Week 16, 18, 20, 21 Nov	Hybridoma Technology: commercial production of antibodies using monoclonal antibodies
22 Nov,2026	Sunday
4thWeek 23, 25, 27, 28 Nov	Vaccines: live attenuated, killed, subunit, conjugate and DNA vaccines. Production of recombinant antibodies and edible vaccines
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
5th Week 30 Nov, 2026	Development of diagnostics and biotech and Nanotech Tools.
December,2026 1st Week 2,4 Dec	Revision + Class Test
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher– Dr. Preeti Sharma + Dr. Ritu

Class – M.Sc. I Biotechnology

Subject–Microbiology and Biotechniques

Paper– M24-BTY-103

September, 2026 1st Week 1, 3 Sept	Various branches and Applications of Microbiology, History and contributions of various scientists to this science, Spontaneous generation versus biogenesis, Distinguishing features of prokaryotic and eukaryotic microbial cells.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 7, 8, 10 Sept	Morphology and arrangement of bacterial cells, Bacterial-flagella, fimbriae, capsule, spores and cysts, cell walls of Gram +ve and Gram -ve bacteria, Nutritional requirements and nutritional categories of microorganisms.
13 Sept , 2026	Sunday
3rd Week 14, 15, 17 Sept	Influence of environmental factors on microbial growth (temperature, oxygen concentration, pH, pressure, solute, light, radiations), Enrichment culture techniques for isolation of microorganisms, pure culture techniques and preservation techniques, study of growth curve.
20 Sept, 2026	Sunday
4th Week 21, 22, 24 Sept	Quantitative measurement of growth, Distinguishing features of bacteria, viruses, Distinguishing features of fungi. Protozoa, algae; Introduction to Microbial Classification and Taxonomy, Taxonomic ranks.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 28, 29 Sept	Various approaches for identification of microorganisms including molecular approaches; Gram (+) and Gram (-) bacteria. Fungi and algae of medical and industrial importance.

October, 2026 1st Week 1 Oct	Sterilization methods-dry heat, moist heat, radiations, filtration, and gaseous sterilization..
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 5, 6, 8 Oct	Factors affecting antimicrobial action, Mode of action of antimicrobial agents Antibiotics and their mode of action, Disinfectants and techniques to evaluate the potency of antimicrobial chemical agents, Types of toxins and their mode of action, Bio-separation, cell disruption, extraction.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 12, 13, 15 Oct	Bio-separation; Cell disruption; Purification by chromatographic techniques- Paper, Thin layer, Gel-filtration, ion exchange, Affinity chromatography, Gas liquid chromatography, High pressure liquid chromatography, Reversed Phase chromatography.
18 Oct, 2026	Sunday
4th Week 19, 22 Oct	Drying; Crystallization; Storage and packaging, Centrifugation Methods: Principles of Sedimentation, centrifugation techniques and their applications, differential centrifugation, Density gradient and ultracentrifugation techniques.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 29 Oct	Revision

November, 2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov-14 Nov	Sessional Exams
15 Nov,2026	Sunday
3rd Week 16, 17, 19 Nov	Electrophoresis: Concept, Factors affecting electrophoresis, Agarose gel electrophoresis, Pulse field gel electrophoresis, PAGE, SDS PAGE, Isoelectrofocusing, 2-Dimensional electrophoresis.
22 Nov,2026	Sunday
4th Week 23, 26 Nov	Microscopy: Light Microscopy-Magnification, resolving power. Numerical aperture, Limit of Resolution.
24 Nov,2026 29 Nov,2026	Guru Nanak Dev JayantiSunday
5th Week 30 Nov, 2026	Principles and applications of bright-field, phase-contrast, fluorescence, scanning and transmission electron microscopy.
December, 2026 1st Week 1, 3 Dec	Revision
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher– Dr. Ritu Rani

Class – M.Sc. II Semester III

Subject– Molecular Genetics

Paper–M24-BTY-303

August, 2026 2ndWeek 3Aug, 5Aug	Eukaryotic Genome Structure and Organization: Genome sequence and chromosome diversity, Variation in chromosome number, Special features of metaphase chromosomes, Chromosome banding.
9Aug, 2026	Sunday
3rdWeek 10Aug, 12Aug	Genome size and complexity, organization and content of human genome, Repetitive DNA, Microsatellites, genome wide repeats, Split genes, overlapping genes, cryptic genes, Retrogenes, Multigene families.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4thWeek 17Aug, 19Aug	Pseudo genes, Nucleosome-Basic Structure, spatial arrangements of histones, chromatosome, Solenoid model, Chromatin domains, Chromatin modifications.
23Aug,2026	Sunday
5thWeek 24Aug, 26Aug	The Mutability of DNA: An overview of mutation and polymorphism, VNTR polymorphism, DNA damage- spontaneous, Induced (Alkylation, oxidation, radiation).
28Aug, 2026 30Aug, 2026	Raksha Bandhan Sunday
31Aug, 2026	Genotoxicity/ mutagenicity test systems - Ames test, Sister Chromatid exchanges, Micronucleus, Comet assay, Positive and Negative control of transcription, Repression and activation, Organization and regulation of Lac, Trp and Ara operon in E. coli, Organization of genome in lambda phage (early, middle and late genes).

September, 2026 1st Week 2 Sept	Regulation of lytic cascade, Antitermination, Repressor proteins (c1, c11, c111, cro), Establishment of lysogeny, cooperative binding of repressor, maintenance of autogenous circuit by c1 repressor.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 7 Sept, 9 Sept	Transcription Regulation in Eukaryotes: Eukaryotic activators, DNA binding domains, Transcriptional repressors, positive and negative regulation of Yeast galactose utilizing genes.
13 Sept, 2026	Sunday
3rd Week 14 Sept, 16 Sept	Signal transduction and control of transcriptional regulators, Gene silencing, Epigenetic gene regulation, Regulatory RNAs: Riboswitches, Interfering RNA (RNAi) and gene expression.
20 Sept, 2026	Sunday
4th Week 21, 23 Sept	Short interfering RNA (siRNA) and its functions, MicroRNA and its functions, Antisense RNA and gene expression, an overview of CRISPER-Cas9 gene editing technology.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 28 Sept, 30 Sept	Site-Specific Recombination: Concept, Recombinases and their function, cre-lox recombination, Biological role and applications of site-specific recombination in genome manipulation.

October,2026 1st Week 5 Oct	Genome Mapping: DNA markers for genetic mapping-RFLP, SSP, SNPs, Physical Mapping- Restriction mapping.
20Oct, 2026 40Oct,2026	Mahatma Gandhi Jayanti Sunday
2ndWeek 7 Oct	Florescent in situ hybridization (FISH), Sequence tagged sites (STS) mapping.
11 Oct,2026	Maharaja Agrasen Jayanti, Sunday
3rdWeek 12, 14 Oct	Genome Sequencing: Types-Whole genome sequencing, Whole exome sequencing, targeted sequencing, metagenomic sequencing.
18 Oct, 2026	Sunday
4thWeek 19Oct, 21 Oct	Clone by clone approach or map-based sequencing, shot gun sequencing; Technologies for genome sequencing- 1st generation sequencing methods (Sanger sequencing, Pyrosequencing).
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5thWeek 28 Oct	Next generation sequencing- High throughput sequencing; Applications of genome sequencing.

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 16, 18 Nov	Comparative Genomics: Concept, Orthologs and paralogs, exon shuffling, Horizontal gene transfer, genome similarity, Comparative genomics in prokaryotes and eukaryotes, genomic synteny, phylogenetic footprinting.
22Nov,2026	Sunday
4thWeek 23, 25 Nov	Functional Genomics -Expression profiling, Transcriptome, DNA Arrays, Gene function determination (Gene knockout strategy, Insertional mutagenesis) Metabolic Engineering: Principle and methods of metabolic engineering.
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
December,2026 1st Week 2 Dec	Directed production of molecules, production of novel compounds, Case studies on rerouting of metabolic pathways; Applications of metabolic engineering.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

**KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN,
KARNAL**

**Lesson Plan for the Odd Semester
(August to December, 2026)**

Name of the Teacher– Dr. Ritu Rani

Class – B.Voc FSQC II Semester III

Subject– Techniques in Biochemistry

Paper– B23-FTQ-304

August,2026 1stWeek 1Aug	Student's Orientation and Timetable Discussion
2 Aug, 2026	Sunday
August,2026 2ndWeek 4, 5, 8Aug	Sampling and sampling techniques.
9Aug, 2026	Sunday
3rdWeek 11, 12 Aug	Proximate analysis- Moisture, ash, crude fat.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4thWeek 18, 19 Aug, 22Aug	Crude fibre, crude protein and carbohydrates by difference method.
23Aug,2026	Sunday
5thWeek 25, 26 Aug, 29Aug	Principles and methods of food analysis.
28Aug, 2026 30Aug, 2026	Raksha Bandhan Sunday

September,2026 1st Week 1, 2 Sept, 5 Sept	Basic principles: Refractometry, HPLC.
4 Sept , 2026 6Sept , 2026	Janmashtmi Sunday
2ndWeek 8, 9 Sept, 12Sept	Basic principles: polarimetry, densitometry.
13Sept , 2026	Sunday
3rdWeek 15, 16 Sept, 19 Sept	Basic principles: GLC, spectrophotometry, electrophoresis.
20Sept,2026	Sunday
4thWeek 22 Sept, 26 Sept	Automatic amino acid analyzer, Test for unsaturation of fats.
23Sept,2026 27Sept,2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5thWeek 29 Sept, 30 Sept	Quantitative analysis of protein by Biuret method.
October,2026 1st Week 3 Oct	Quantitative analysis of protein by Ninhydrin method, Lowry's method and Dye-binding method.
20Oct, 2026 4Oct,2026	Mahatma Gandhi Jayanti Sunday
2ndWeek 6, 7 Oct, 10Oct	Bio assays for protein quality of grains.
11 Oct,2026	Maharaja Agrasen Jayanti, Sunday
3rdWeek 13, 14 Oct, 17 Oct	Chemical methods of analysis of fat soluble and water soluble vitamins.
18Oct, 2026	Sunday
4thWeek 20, 21 Oct, 24 Oct	Microbiological methods of analysis of fat soluble and water soluble vitamins.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5thWeek 27, 28 Oct, 31 Oct	Fluro metric methods of analysis of fat soluble and water soluble vitamins.

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 17, 18 Nov, 21 Nov	Determination of starch
22Nov,2026	Sunday
4thWeek 24,25 Nov, 28 Nov	Colorimetric methods of analysis of fat soluble and water soluble vitamins.
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
December,2026 1st Week 1, 2 Dec	Rancidity of fats
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher – Dr. Twinkle Sugla

Class – B.Sc. 1st Semester I (BiotechnologyMinor)

Subject – Laboratory Techniques & Practices

Paper – B23-BTY-103

August, 2026 2 nd Week 6 Aug	Lab rules and safety measures to be taken in Biotechnology Lab., Commonly used equipments for Biotechnological work- Laminar air-flow
9 Aug, 2026	Sunday
3 rd Week 13 Aug	Commonly used equipments for Biotechnological work- Centrifuge, pH meter, Incubator, Fermenter, Colony-counter, Autoclave
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 20 Aug	Commonly used equipments for Biotechnological work- Inoculating loop and needle. Use of bright-field microscope, Colorimeter and spectrophotometer.
23 Aug, 2026	Sunday
5 th Week 27 Aug	Preparation of standard curve, Preparation of buffers solutions and determination of their pH. Preparation of normal, molar, percent solutions, buffer.
28 Aug, 2026 30 Aug, 2026	Raksha Bandhan Sunday

September, 2026 1st Week 3 Sept	Qualitative and quantitative estimation of various biomolecules- sugars, proteins; Determination of various metabolites in given biological samples.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 10 Sept	Thin-layer, Paper and Two-dimensional Chromatography; Paper electrophoresis.
13 Sept , 2026	Sunday
3rd Week 17 Sept	Sterilization techniques followed in biotechnology lab.-dry sterilization techniques.
20 Sept, 2026	Sunday
4th Week 24 Sept	Sterilization techniques followed in biotechnology lab.- wet sterilization techniques.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday

October, 2026 1st Week 1 Oct	Preferred method of sterilization for different materials; Biological indicators for checking the efficiency of sterilization process.
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 8 Oct	Evaluation of different disinfectants and antiseptics and their usage.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 15 Oct	Preparation of cotton plugs and different types of culture media for growth of microorganisms.
18 Oct, 2026	Sunday
4th Week 22 Oct	Preparation of animal and plant cell culture media.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 29 Oct	Preparation of dilutions and isolation of micro-organisms from air, water and soil.

November, 2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov - 14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 19 Nov	Sub- culturing/ Picking off technique- streaking, pour-plate, spread plate methods.
22 Nov, 2026	Sunday
4th Week 26 Nov	Revision
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
December, 2026 1st Week 3 Dec	Revision
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

**KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN,
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**Lesson Plan for the Odd Semester
(August to December, 2026)**

Name of the Teacher – Dr. Twinkle Sugla

Class – M.Sc. I Sem

Subject – Biomolecules

Paper – M24-BTY-101

September, 2026 1st Week 1, 3, 5 Sept	Water: Structure, hydrogen bonding, as a biological solvent, ionization and fitness of the aqueous environment for living organisms. pH; Buffers; an introduction to physiological buffers.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 8, 10, 12 Sept	Carbohydrates: Structure, occurrence and biological importance of important monosaccharides, oligosaccharides and polysaccharides.
13 Sept , 2026	Sunday
3rd Week 15, 17, 19 Sept	Carbohydrate of Industrial importance (cane sugar, starch, gum arabica, pectin, cellulose). Glycosaminoglycans; Proteoglycans.
20 Sept, 2026	Sunday
4th Week 22, 24, 26 Sept	Amino acids and Proteins: Common structural features, Classification by R group, Zwitter ion structures.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 29 Sept	Acid-base properties; titration curves of amino acids; Essential amino acids; Biologically active peptide.

October, 2026 1st Week 1, 3 Oct	Classification and different structural levels (Primary, secondary, tertiary & quaternary) of proteins. Ramachandran plot. Basic introduction to terms: domains, motifs, prion protein.
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 6, 8, 10 Oct	Determination of amino acid sequences of proteins; Effect of amino acid sequence on the function of a protein and stability. Chemical synthesis of polypeptides.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 13, 15, 17 Oct	Lipids: Classification, structures, nomenclature of fatty acids. Essential fatty acids; Acylglycerols. Characterization of fats- Saponification value, iodine number, rancidity, acid value.
18 Oct, 2026	Sunday
4th Week 20, 22, 24 Oct	Structure and properties of phospholipids and sphingolipids: (sphingomyelins, cerebroside & gangliosides)
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 29, 31 Oct	Structure and functions of Prostaglandins, Prostacyclins, Thromboxanes, Leukotrienes and Sterols.

November, 2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov - 14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 17, 19, 21 Nov	Nucleic Acids: Structure and properties of purines and pyrimidine bases; Nucleosides and Nucleotides. Biologically important nucleotides; Nucleic acids as the genetic material – experimental evidences; Chargaff's rules;
22 Nov, 2026	Sunday
4th Week 24, 26, 28 Nov	The covalent backbone of nucleic acids; Double helical model of DNA structure. Structural polymorphism of DNA (A, B and Z-DNA) and RNA; Denaturation & annealing of DNA; Biological functions of nucleotides; Chemical synthesis of oligonucleotides.
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
December, 2026 1st Week 1 Dec-4 Dec	Revision
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher –Dr. Twinkle Sugla and Dr. Radhika

Class – M.Sc. III Sem

Subject – General and Applied Microbiology

Paper – M24-OEC-332

August, 2026 2 nd Week 5,6 Aug	History, development, scope and applications of Microbiology. Rhizosphere & Rhizoplane micro-organisms and its significance.
9 Aug, 2026	Sunday
3 rd Week 12, 13 Aug	General methods of sterilization. Biofertilizers and its examples.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 19, 20 Aug	Introduction to Microscopy: bright field microscopy, dark field microscopy. Nitrogen fixing bacteria: Symbiotic & non-symbiotic.
23 Aug, 2026	Sunday
5 th Week 26, 27 Aug	Phase contrast microscopy, electron microscopy. Modes of transmission of disease: Air.
28 Aug, 2026 30 Aug, 2026	Raksha Bandhan Sunday

September, 2026 1st Week 2, 3 Sept	Various methods of staining of bacteria (simple, negative and Gram). Modes of transmission of disease: Water, soil.
4 Sept, 2026 6 Sept, 2026	Janmashtmi Sunday
2nd Week 9, 10 Sept	Methods of staining of fungus (mold and yeast). Modes of transmission of disease: Contact, animals.
13 Sept, 2026	Sunday
3rd Week 16, 17 Sept	Whittaker system of classification. Coliforms as the biological indicators of water safety and their assessment.
20 Sept, 2026	Sunday
4th Week 23, 24 Sept	Morphology & fine structure of bacterial: cell wall, cell membrane, flagella and capsules. Control of microbes in food by physical methods: temperature, irradiation.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 30 Sept	Nutritional requirements and nutritional types of bacteria.

October, 2026 1st Week 1 Oct	Control of microbes in food by physical methods: Filtration, osmotic pressure.
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 7, 8 Oct	Pure culture techniques –pour plate, spread plate. Use of Genetically Engineered Micro-organisms (GEMs): (a) Production of antibiotics: Penicillin.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 14, 15 Oct	Pure culture techniques –Serial dilution agar plate method. Use of Genetically Engineered Micro-organisms (GEMs): Biopesticides: Bt toxin.
18 Oct, 2026	Sunday
4th Week 21, 22 Oct	Preservation of microbial culture-serial subculture, at very low temperature. Use of Genetically Engineered Micro-organisms (GEMs): Biopesticides: Boverin, DeVine.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 28, 29 Oct	Preservation of microbial culture-Overlaying culture with mineral oil. Test.

November, 2026 1st Week 1 Nov-9 Nov	Vacations (Diwali)
2nd Week 10 Nov - 14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 18, 19 Nov	Preservation of microbial culture- lyophilization or freeze drying, in liquid nitrogen.
22 Nov, 2026	Sunday
4th Week 25, 26 Nov	Control of pollution: degradation of xenobiotic compound.
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
December, 2026 1st Week 2, 3 Dec	Revision
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

**KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN,
KARNAL**

Lesson Plan for the Odd Semester

(August to December, 2026)

Name of the Teacher– Dr. Radhika

Class – B.Sc. 2nd Semester III (Biotechnology minor)

Subject– Animal Tissue Culture

Paper– B25-BTY-304

August,2026 1stWeek 1Aug	Orientation and syllabus discussion.
2 Aug, 2026	Sunday
2ndWeek 6, 7, 8Aug	Introduction to Animal Cell Culture: Historical development and milestones in cell culture; Basics of cell biology relevant to culture.
9Aug, 2026	Sunday
3rdWeek 13, 14Aug	Types of cell cultures: Primary, Secondary, and Continuous cell lines.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4thWeek 20, 21, 22Aug	Laboratory setup and biosafety in cell culture.
23Aug,2026	Sunday
5thWeek 27, 29Aug	Culture media: Composition, types, and preparation.
28Aug, 2026 30Aug, 2026	RakshaBandhan Sunday

September,2026 1 st Week 3, 5 Sept	Aseptic techniques and sterilization.
4 Sept , 2026 6Sept , 2026	Janmashtmi Sunday
2 nd Week 10, 11, 12 Sept	Subculturing, cryopreservation, and thawing of cells.
13Sept , 2026	Sunday
3 rd Week 17, 18, 19 Sept	Cell viability, growth kinetics, and characterization.
20Sept,2026	Sunday
4 th Week 24, 25, 26 Sept	Contamination: Sources, detection, and prevention. Serum and serum-free culture systems.
23 Sept,2026 27 Sept,2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
October,2026 1 st Week 1, 3 Oct	Introduction to Stem cell culture (ESCs, iPSCs, MSCs).
2Oct, 2026 4Oct,2026	Mahatma Gandhi Jayanti Sunday
2 nd Week 8, 9, 10 Oct	3D culture and organoid technology (introductory). Co-culture and suspension culture techniques.
11Oct,2026	Maharaja Agrasen Jayanti, Sunday
3 rd Week 15, 16, 17 Oct	Scaling up cell culture: Bioreactors, Perfusion systems.
18Oct, 2026	Sunday
4 th Week 22, 23, 24 Oct	Cytotoxicity and cell-based assays.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5 th Week 29, 30, 31 Oct	Applications in vaccine production, toxicology, and recombinant protein expression. Animal biotechnology: Embryo culture.

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 19, 20, 21 Nov	Animal biotechnology: cloning, and gene editing. Cell culture in cancer research and regenerative medicine.
22Nov,2026	Sunday
4thWeek 26, 27, 28 Nov	Ethical concerns and regulatory aspects in animal cell culture. Course revision and doubt-clearing.
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
December,2026 1st Week 3, 4 Dec	Course revision and doubt-clearing.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester

(August to December, 2026)

Name of the Teacher– Dr. Radhika

Class – M.Sc. 1 Semester

Subject– Molecular Cell Biology

Paper– M24-BTY-102

September, 2026 1 st Week 1, 2 Sept	Overview of cells and cell research: Origin and evolution of cells, Cells as experimental models, tools of cell biology.
4 Sept, 2026 6 Sept, 2026	Janmashtmi Sunday
2 nd Week 7, 8, 9 Sept	Fundamentals of Molecular Biology: Heredity, Genes, and DNA Expression of Genetic Information. Recombinant DNA, Detection of Nucleic Acids and Proteins.
13 Sept, 2026	Sunday
3 rd Week 14, 15, 16 Sept	Nucleus: Nuclear envelope and traffic between the nucleus and cytoplasm, internal organization of the nucleus, nucleolus, nucleus during mitosis. Protein Sorting and Transport: Endoplasmic reticulum.
20 Sept, 2026	Sunday
4 th Week 21, 22, 23 Sept	DNA Replication: DNA polymerases, replication fork, fidelity of replication, origins and initiation of replication, replication at the ends of chromosomes.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5 th Week 28, 29, 30 Sept	Mutations: nonsense, missense, frameshift and point mutations; intragenic I and intergenic suppression I DNA Repair: Direct reversal of DNA damage, excision repair. error-prone repair, recombinational repair.

20Oct, 2026 40Oct,2026	Mahatma Gandhi Jayanti Sunday
2 nd Week 5, 6, 7 Oct	RNA Synthesis and Processing: Prokaryotic transcription. Eukaryotic transcription: RNA polymerases, transcription factors. Model systems of transcriptional control: lac operon, trp operon, lambda phage; promoters, enhancers, repressors, RNA processing and turnover.
11Oct,2026	Maharaja Agrasen Jayanti, Sunday
3 rd Week 12, 13, 14 Oct	Protein Synthesis, Processing and Regulation: universal genetic code, degeneracy of codons, mechanisms of initiation, elongation and termination of translation, wobble hypothesis, Protein folding and processing, regulation of protein function, protein degradation.
18Oct, 2026	Sunday
4 th Week 19, 21 Oct	Cell Signaling: Signaling molecules and their receptors, functions of cell surface Receptors. Pathways of intracellular signal transduction, signal transduction and cytoskeleton.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5 th Week 27, 28 Oct	Developmental abnormalities due to defective signaling pathways, Signal transducing machinery as targets for potential drugs. Cell death and cell renewal: programmed cell death, stem cells and maintenance of adult tissues.

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 16, 17, 18 Nov	Embryonic stem cells and therapeutic cloning. Cancer: Development and causes of cancer, tumour viruses, oncogenes. Tumour suppressor genes, application of molecular biology to cancer prevention and treatment.
22Nov,2026	Sunday
4thWeek 23, 25 Nov	Genetic screening in cancer. Treatment & Review: Targeted therapies, immunotherapy approaches, molecular pathway overview, and exam study strategies.
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
5thWeek 30 Nov,2026	Revision, Query Session & Previous Year Questions Review.
December,2026 1st Week 1, 2 Dec	Final Overview & Doubt Clearance, Important Topics Discussion, Final Feedback & Closing.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester

(August to December, 2026)

Name of the Teacher– Dr. Twinkle and Dr. Radhika

Class – M.Sc. III semester

Subject– Plant Biotechnology

Paper– M24-BTY-301

August,2026 1 st Week 1Aug	Syllabus and Timetable discussion.
2 Aug, 2026	Sunday
2 nd Week 3, 4, 5, 8 Aug	Organization of plant genome - Nuclear genome, Chloroplast and mitochondrial genome. Strategies for biotic stress resistance - Viral resistance, Fungal and Insect resistance.
9Aug, 2026	Sunday
3 rd Week 10, 11, 12 Aug	Gene tagging. Chloroplast transformation vector designing, method, advantages. Herbicide resistance. Abiotic stresses (drought, salinity, temperature).
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 17, 18, 19, 22 Aug	Agrobacterium mediated transformation: Ti and Ri plasmids. Role of virulence genes, mechanism of T-DNA transfer. Genetic engineering for molecular farming (Antibodies), Production of vaccines & medically related proteins.
23Aug,2026	Sunday
5 th Week 24, 25, 26, 29Aug	Vectors based on Ti/Ri plasmids (cointegrate and binary vectors). Technique and factors affecting Agrobacterium transformation. Nutritional enhancement in plants (carbohydrates).
28Aug, 2026 30Aug, 2026	RakshaBandhan Sunday
31Aug, 2026	Direct gene transfer - Particle bombardment

September, 2026 1st Week 1, 2, 5 Sept	Direct gene transfer - ArF excimer laser & electroporation. Nutritional enhancement (seed storage proteins, vitamins).
4 Sept , 2026 6Sept , 2026	Janmashtmi Sunday
2ndWeek 7, 8, 9, 12Sept	Direct gene transfer - microinjection and alternative methods; Screenable and selectable markers. Manipulation of flower colours; Production of enzymes of industrial importance.
13Sept , 2026	Sunday
3rdWeek 14, 15, 16, 19 Sept	Analysis of transgenic plants for transgene presence & integration; Expression of transgenes & biological assays. Plant cells as bio-factories for secondary metabolites. Types of cell culture systems used.
20Sept, 2026	Sunday
4thWeek 21, 22, 26 Sept	Gene silencing in transgenic plants. Gene stacking in plants - methods, advantages, and drawbacks. Advantages of in vitro production of secondary metabolites.
23Sept, 2026 27Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5thWeek 28, 29, 30 Sept	IPR Introduction (Patents, trade secrets), Copyright, Geographical indications, trademarks. Strategies for high yield product development for 2 ^o metabolite.

October,2026 1st Week 3 Oct	Strategies for high yield product development: improving crop yield and quality.
2Oct, 2026 4Oct,2026	Mahatma Gandhi Jayanti Sunday
2nd Week 5, 6, 7, 10 Oct	GATT & TRIPPS, Patenting of biological material; Plant breeders rights (PBRs) and farmers rights. Selection of high yielding cell line cultures; Optimization of physical culture conditions.
11Oct,2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 12, 13, 14, 17 Oct	Clean gene technology. Current status of transgenic crops. Optimization of media and biochemicals, Immobilization of plant cells.
18Oct, 2026	Sunday
4th Week 19, 21, 24 Oct	Bane and boon of GM crops. Bioreactors for plant cell and organ cultures. Bioreactors for immobilized plant cell cultures.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 28, 31Oct	Concerns about GM crops - environmental issues. Biotransformation. Permeabilization of cells

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 16, 17, 18, 21 Nov	Concerns about GM crops -Biosafety issues; ethical issues Removal of secreted products. Revision: Stress resistance & molecular farming.
22Nov,2026	Sunday
4thWeek 23, 25, 28 Nov	Revision Query Session & Previous Year Questions Review.
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
5thWeek 30Nov, 2026	Revision.
December,2026 1st Week 1, 2 Dec	Final Overview & Doubt Clearance. Important Topics Discussion. Final Feedback & Closing.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher– Ms. Manpreet Kaur

Class – B. Sc. 2nd Biotechnology Sem III

Subject– Cell Biology

Paper– B23-BTY- 301

August, 2026 1 st Week 1 Aug	Basics of Cell Biology : Introduction to the Subject Syllabus Discussions
2 Aug, 2026	Sunday
2 nd Week 3, 4, 5 Aug	Discovery of cell and Cell Theory; Comparison between plant and animal cells. TEST
9 Aug, 2026	Sunday
3 rd Week 10, 11, 12 Aug	Structure and function of Protoplasm, Cell wall, Plasma membrane, Membrane structure and transport – Models of membrane structure, Membrane lipids, proteins and carbohydrates
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4 th Week 17, 18, 19 Aug	Modification of plasma membrane and intracellular junctions. TEST
23 Aug, 2026	Sunday
5 th Week 24, 25, 26 Aug	Structure and function of Cytoskeleton, Mitochondria, Chloroplast
28 Aug, 2026 30 Aug, 2026	Raksha Bandhan Sunday
31 Aug, 2026	Structure and function of ER, Golgi complex

September, 2026 1st Week 1, 2, 3 Sept	Structure and function of Lysosome, endosome and microbodies. TEST
4 Sept , 2026 6Sept , 2026	Janmashtmi Sunday
2nd Week 7, 8, 9 Sept	Structure and function of Ribosome, Centriole, Nucleus, Chromosomes.
13 Sept , 2026	Sunday
3rd Week 14, 15, 16 Sept	Chemical components of a cell, Catalysis and use of energy by cells.
20 Sept,2026	Sunday
4th Week 21, 22 Sept	Biosynthetic process in ER and Golgi apparatus.
23 Sept,2026 27 Sept,2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 28, 29, 30 Sept	Protein synthesis and folding in the cytoplasm. TEST

October, 2026 1st Week 1, 3 Oct	Degradation of cellular components. TEST
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 5, 6, 7 Oct	Structure and function of Prokaryotic cell and its components - The Slime and the cell wall of bacteria.
11Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 12, 13, 14 Oct	Structure and function of Peptidoglycan and related molecules; the outer membrane of Gram-negative bacteria, the cytoplasmic membrane.
18Oct, 2026	Sunday
4th Week 19, 21, Oct	Solute transport by Simple diffusion, Facilitated diffusion and Active transport. Water and ion transport, mesosomes, flagella, Pilus, fimbriae.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 28 Oct	Ribosomes, carboxysomes, sulfur granules, glycogen, polyphosphate bodies, fat bodies, gas vesicles; endospores, exospores, cysts.

November, 2026 1st Week 1 Nov - 9 Nov	Vacations (Diwali)
2nd Week 10 Nov-14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 16, 17, 18 Nov	Mycelia of fungi and Actinomycetes, Cytoskeleton filament, heterocysts and akinets of Cyanobacteria, Gliding and motility
22Nov,2026	Sunday
4th Week 23, 25 Nov	Cell cycle - An overview of cell cycle, Components of cell cycle control system
24 Nov,2026 29 Nov,2026	Guru Nanak Dev Jayanti Sunday
5th Week 30 Nov, 2026	Programmed cell death (Apoptosis). TEST
December,2026 1st Week 1, 2 Dec	Intracellular and Extra-cellular control of cell division,
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

**KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN,
KARNAL**

**Lesson Plan for the Odd Semester
(August to December, 2026)**

Name of the Teacher– Ms. Manpreet Kaur

Class – M.Sc. 1 Biotechnology Sem I

Subject– Enzyme Technology

Paper– M24- BTY – 104

September, 2026 1st Week 1, 2, 5 Sept	History of Enzymology; General characteristics of enzymes. Advantages of enzymes over chemical catalysts. Nomenclature and classification of enzymes, Significance of enzymes Commission.
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 8, 9, 11, 12 Sept	Denaturation and renaturation; Isoenzymes, enzyme specificity, monomeric and oligomeric enzymes, multienzyme complex. Holoenzyme, apoenzyme, cofactor, coenzyme, prosthetic group; enzyme activity unit, turnover number and specific activity. Ribozymes and Abzymes A brief account. TEST
13 Sept , 2026	Sunday

3rd Week 15, 16, 18, 19 Sept	Enzyme action; effect of enzyme on the rate and equilibrium of a reaction. Principles that explain catalytic power and substrate specificity of enzymes; Enzyme substrate complex (Lock & Key Model, Induced Fit Theory, Substrate Strain Theory). Factors responsible for catalytic efficiency of enzyme; proximity and orientation effect, acid-base catalysis, covalent catalysis, strain and distortion theory.
20 Sept, 2026	Sunday
4th Week 22, 25, 26 Sept	Nature of active site, identification of functional groups at active sites. Regulatory enzymes- covalently modulated enzymes, allosteric enzymes and their mode of action. Regulation of enzyme activity in the living system. TEST
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 29, 30 Sept	X-ray crystallography and NMR spectrometry importance of 3-D structure of an enzyme. Classification of enzyme structures, structures adopted by enzymes, Principles that govern the 3-D structure adopted by enzymes. Forces for stability of 3-D structure. An introduction to enzyme kinetics and its importance. Methods used for investigating the kinetics of enzyme catalysed reactions.

October, 2026 1st Week 3 Oct	Factors that influence the velocity of enzyme catalysed reaction (effect of substrate concentration, enzyme concentration, pH, temperature, presence of activator/inhibitor etc.). TEST
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 6, 7, 9, 10 Oct	Michaelis-Menten equation, V_{max} , K_m and its significance; Lineweaver Burk plot- its advantages and limitations, Eadie- Hofstee and Hanes plots enzyme inhibition. Types of enzyme inhibitions- competitive, uncompetitive, noncompetitive, mixed type inhibition.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 13, 14, 16, 17 Oct	Determination of K_i . Determination of K_m and V_{max} in the presence and absence of inhibitor; feed- back inhibition. Bisubstrate reactions- brief introduction to sequential and Ping-Pong mechanism with examples.
18 Oct, 2026	Sunday
4th Week 21, 23, 24 Oct	Strategies used for enzyme production, isolation and purification at laboratory and industrial scale from plant, animal and microbial sources. Method of calculating the purification fold; estimation of enzyme activity; characterization of an enzyme, criteria of enzyme purity.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 28, 30, 31 Oct	Determination of the molecular weight (MW) and the number of sub-units of an enzyme; Enzyme immobilization and its importance; protein engineering; enzyme therapy. TEST

November, 2026 1st Week 1 Nov - 9 Nov	Vacations (Diwali)
2nd Week 10 Nov-14 Nov	Sessional Exams
15 Nov, 2026	Sunday
3rd Week 17, 18, 20, 21 Nov	Enzyme inhibitors and drug design; enzymes as biosensors , enzyme reactors. Applications of enzymes in medicine, textile, leather, detergent, paper, bakery, dairy industry, beverage and fruit processing.
22 Nov, 2026	Sunday
4th Week 25, 27, 28 Nov	Applications of food processing and preservation, clinical applications of enzyme estimation. TEST
24 Nov, 2026 29 Nov, 2026	Guru Nanak Dev Jayanti Sunday
December, 2026 1st Week 1, 4 Dec	Doubts clearance, PYQs Discussions and Revisions
5 Dec, 2026	Preparatory Holidays
2nd Week 7 December, 2026 Onwards	University Examinations

**KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN,
KARNAL**

**Lesson Plan for the Odd Semester
(August to December, 2026)**

Name of the Teacher–Ms. Sonika

Class – B.Sc. 1st (Sem-I)

Subject–Introduction of Biotechnology

Paper–B23-BTY-101

August,2026 1stWeek 1Aug	Student's Orientation and Timetable Discussion
2 Aug, 2026	Sunday
2ndWeek 3,4,5thAug	Biotechnology in the context of the developing world,public perception of biotechnological products,Introduction to biotechnology – an interdisciplinary pursuit; Main areas of application of biotechnology; Biotechnology research in India
9Aug, 2026	Sunday
3rdWeek 10,11,12th Aug	Very brief account of intellectual property rights, copyright, trade mark, trade secret, PBR.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4thWeek 17,18,19thAug	Substrates (raw materials) and the future of biotechnology. In brief: scope and techniques of preservation.
23Aug,2026	Sunday
5thWeek 24,25,26thAug	Introduction to fermentation technology. Application of industrial biotechnology.
28Aug, 2026 30Aug, 2026	Raksha Bandhan Sunday
31Aug, 2026	Introduction of animal tissue culture (brief of history, culture media, substrate surfaces, culture procedures, primary cultures, cell lines.

September, 2026 1st Week 1, 2 Sept	Organ culture and tissue engineering, Introduction to plant tissue culture (in brief history, culture media, explants, totipotency, dedifferentiation and types of cell & tissue culture etc.)
4 Sept , 2026 6 Sept , 2026	Janmashtmi Sunday
2nd Week 7, 8, 9th Sept	Scope and applications of animal biotechnology and plant biotechnology. Brief account of immunotechnology: immune system (immune cells, types of immunity and general structure of immunoglobulins).
13 Sept, 2026	Sunday
3rd Week 14, 15, 16th Sept	Hybridoma technology and monoclonal antibodies.
20 Sept, 2026	Sunday
4th Week 21, 22, 23 Sept	In vitro fertilization and embryo transfer technology in brief.
23 Sept, 2026 27 Sept, 2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5th Week 28, 29, 30th Sept	Introduction to enzyme technology: nature of enzymes, applications of enzymes, and immobilized enzymes.
2 Oct, 2026 4 Oct, 2026	Mahatma Gandhi Jayanti Sunday
2nd Week 5, 6, 7th Oct	Introduction to molecular markers and genetic mapping. Brief account of safety guidelines, risk assessment and ethics in biotechnology. Genetics and Biotechnology: Introduction of genetic engineering, gene and genomes, proteins and proteome, history of genetic manipulations, DNA fingerprinting and forensic analysis. Industrial genetics, Potential laboratory biohazards of genetic engineering.
11 Oct, 2026	Maharaja Agrasen Jayanti, Sunday
3rd Week 12, 13, 14th Oct	Environmental Biotechnology: An overview, scope, and market of biological control of the environment.
18 Oct, 2026	Sunday
4th Week 19, 20, 21 Oct	Brief account on bioremediation and waste treatment biotechnology, microbial insecticides.
20 Oct, 2026 25 Oct, 2026 26 Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5th Week 27, 28th Oct	Biofertilizers, microbes in oil recovery and bioleaching

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 16Nov-21 Nov	Application of biotechnology in medicine (pharmaceutical industry, vaccines, antibiotics, etc.), food industry, biofuels and chemical industry.
22Nov,2026	Sunday
4thWeek 23, 24, 25thNov	Application of Biotechnology in the food industry, biofuels and chemical industry.
24Nov,2026 29 Nov,2026	Guru Nanak Dev Jayanti Sunday
5thWeek 30 Nov,2026	Protein techniques.
December,2026 1st Week 1, 2 Dec	Genomics techniques.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations

KUMARI VIDYAVATI ANAND D.A.V. COLLEGE FOR WOMEN, KARNAL

Lesson Plan for the Odd Semester (August to December, 2026)

Name of the Teacher–Ms Sonika

Class – MSc 2nd (Sem-III)

Subject–Microbial Biotechnology

Paper–M24-BTY-302

August,2026 1stWeek 1Aug	Microbial Biotechnology: Scopes application and challenges. Biology of industrial micro- organisms: Industrial microorganisms, growth metabolism regulation, substrate assimilation/ product formation.
2 Aug, 2026	Sunday
2ndWeek 3, 4, 5, 6thAug	Isolation and preservation of industrially important microorganisms. Fermentation system; batch and continuous system, fed batch system, multistage system.
9Aug, 2026	Sunday
3rdWeek 10, 11, 12, 13thAug	Solid state fermentation and its application.
15 Aug, 2026 16 Aug, 2026	Independence Day Sunday
4thWeek 17, 18, 19, 20thAug	SSF reactors,MSF (multiple stage fermentation).
23Aug,2026	Sunday
5thWeek 24, 25, 26, 27thAug	Overproduction of primary & secondary metabolites: Use of mutation, selection and recombination techniques.
28Aug, 2026 30Aug, 2026	Raksha Bandhan Sunday
31Aug, 2026	Media formulation.

September,2026 1st Week 1, 2, 3, Sept	Fermentation raw materials: Media for industrial fermentations; criteria used in media formulation.
4 Sept, 2026 6 Sept, 2026	Janmashtmi Sunday
2ndWeek 7, 8, 9, 10th Sept	Fermenter/bioreactor design and operation; types of fermenter, stirred tank reactor, bubble column reactor, airlift reactor, packed bed reactor, fluidized bed reactor.
13 Sept, 2026	Sunday
3rdWeek 14, 15, 16, 17th Sept	Trickle bed reactor, agitation and aeration in a reactor, mass transfer. Foam formation and control.
20 Sept,2026	Sunday
4thWeek 21-22-23-24th Sept	Industrial production of alcoholic beverages (whisky, wine and beer) and improvement by genetic engineering.
23 Sept,2026 27 Sept,2026	Shaheedi Divas/Haryana War Heroes' Martyrdom Day Sunday
5thWeek 28, 29, 30th Sept	Microbial production of food additives: amino acids, nucleosides and vitamins.
October,2026 1st Week 1Oct	Microbial production of industrial chemicals: Bulk organic chemicals ethanol, citric acid, acetic acid, gluconic acid, glycerol, acetone and butanol.
2Oct, 2026 4Oct,2026	Mahatma Gandhi Jayanti Sunday
2nd Week 5, 6, 7, 8th Oct	Microbial production of healthcare products: antibiotics (Penicillin &tetracyclines), Vaccines (Bacterial cells and bacterial toxins)
11Oct,2026	Maharaja Agrasen Jayanti, Sunday
3rdWeek 12, 13, 14, 15th Oct	Microbial inoculants: Food starter cultures; baker's yeast, starter cultures for the dairy industry, meat starter cultures,
18Oct, 2026	Sunday
4th Week 19, 20, 21, 22 Oct	Biomass production: single cell protein (SCP) production; microbial inoculants.
20Oct, 2026 25Oct, 2026 26Oct, 2026	Dussehra Sunday Maharishi Valmiki Jayanti
5thWeek 27, 28, 29th Oct	Microbial transformation of steroids and sterols. Down-stream processing: separation processes for microbial cells and other solids, cell disruption, centrifugation, solvent recovery, drying and crystallization.

November,2026 1st Week 1Nov-9 Nov	Vacations (Diwali)
2ndWeek 10 Nov-14 Nov	Sessional Exams
15Nov,2026	Sunday
3rdWeek 16, 17, 18, 19th Nov	Recovery schemes for non-volatile metabolites, biomass, extracellular polysaccharides and enzymes.
22 Nov,2026	Sunday
4thWeek 23Nov	EPS (Exopolysaccharides).
24Nov,2026 29Nov,2026	Guru Nanak Dev Jayanti Sunday
5thWeek 30Nov,2026	DSP and USP Process (upstream and downstream process) for cell recovery.
December,2026 1st Week 1, 2, 3 Dec	Isolation and preservation of industrially important microorganisms.
5 Dec, 2026	Preparatory Holidays
2ndWeek 7 December, 2026 Onwards	University Examinations