

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Biology

Paper- Paper VII

Class- B.Sc. Biotechnology

October, 2021 2 nd Week 14 Oct and 16 Oct	Molecular Biology: Introduction to molecular aspects of life. DNA as the genetic material – experiments proving DNA and RNA as genetic material.
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 21 Oct-23 Oct	Nucleic acids: Structure, function and properties of DNA and RNA. Watson and Crick model of DNA. DNA forms (A, B and Z), their characteristic. Different types of RNA, their structure and function
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 28 Oct-30 Oct	Organization of Genomes – bacterial, viral, human, organelles. Eukaryotic genomes: Chromosomal organization and structure. Euchromatin, heterochromatin, centromere, telomere. Chromatin structure (nucleosome), histone and non-histone proteins
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 11 Nov-13 Nov	Insertion elements and transposons; IS elements, transposable elements of Maize and P elements of Drosophila. Extra chromosomal DNA in prokaryotes – plasmids.
14 Nov, 2021	Sunday
3 rd Week 18 Nov-20 Nov	Central dogma of molecular biology. Semi-conservative mode of DNA replication, experimental proof. Unidirectional and bidirectional mode of DNA replication, theta model and rolling circle model.
21 Nov, 2021	Sunday
4 th Week 25 Nov-27 Nov	DNA replication in prokaryotes and eukaryotes, different stages, proteins and enzymes involved.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Biology

Paper- Paper VII

Class- B.Sc. Biotechnology

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 01 Dec-04 Dec	DNA damage and repair: causes of DNA damage, mutations. Repair mechanisms- photo reactivation, excision repair, mismatch repair, SOS repair.
05 Dec, 2021	Sunday
2 nd Week 09 Dec -11 Dec	Genetic Code: concept, elucidation or cracking of genetic code, features of genetic code, Wobble hypothesis.
12 Dec,2021	Sunday
3 rd week 16 Dec -18 Dec	Structure of gene- introns/exons, regulatory sequences, structure of prokaryotic gene.
19 Dec,2021	Sunday
4 th Week 23 Dec-24 Dec	Transcription in prokaryotes and eukaryotes, diff. stages, mechanism, promoters, transcription factors, RNA polymerases.
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 30 Dec -01 Jan	Post transcriptional modifications- 5' cap formation, 3'-end processing/polyadenylation
2 Jan ,2022	Sunday
Jan ,2022 1 st week 6 Jan – 8 Jan	gene splicing and generation of mature mRNA. Inhibitors of transcription.
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Biology

Paper- Paper VII

Class- B.Sc. Biotechnology

2 nd week 13 Jan – 15 Jan	Translation/Protein synthesis: Mechanism of initiation, elongation and termination of protein synthesis in prokaryotes and eukaryotes. Inhibitors of translation
--	--

16 Jan ,2022	Sunday
3 rd week 20 Jan – 22 Jan	Post-translational modifications.
23 Jan ,2022	Sunday
4 th Week 27 Jan – 29 Jan	Regulation of Gene Expression in prokaryotes and eukaryotes, induction and repression, positive and negative regulation. Operon model- lac operon
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 3Feb-4 Feb	Operon model- ara, trp, catabolite repression, transcription attenuation.
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 10 Feb- 12 Feb	Molecular mechanisms of DNA recombination in eukaryotes – Site Specific and Homologous recombination.
13 Feb ,2022	Sunday
3 rd week 17 Feb- 19 Feb	Recombination in prokaryotes – Transformation, transduction and conjugation

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Microbiology

Paper- Paper BT-102

Class- M.Sc. Semester – I

October, 2021 2 rd Week 11 Oct-16 Oct	Various branches and applications of Microbiology, History and contributions of various scientists to this science with particular reference to the contribution of the following scientists- A.V.Leeuwenhoek, Louis Pasteur, Edward Jenner, Robert Koch, Alexander Fleming and Joseph Lister.
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	Morphology and arrangement of bacterial cells, Bacterial- flagella, Fimbriae

20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	capsule, spores and cysts, cell walls of Gram +ve and Gram –ve bacteria
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	Nutritional requirements and nutritional categories of microorganisms
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Physical factors for growth
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Enrichment culture techniques for isolation of microorganisms, pure culture techniques and preservation techniques

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Microbiology

Paper- Paper BT-102

Class- M.Sc. Semester – I

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Study of growth curve, measurement of growth.
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Distinguishing features of bacteria, viruses, fungi, protozoa, algae. Criteria used for characterization including molecular approaches
12 Dec,2021	Sunday

3 rd week 13 Dec -18 Dec	Classification, Nomenclature and Identification of microorganisms, taxonomy and nomenclature based upon Bergey's manual
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	Gram (+) and Gram (-) bacteria of medical and industrial importance (Pseudomonas, Azotobacter, Rhizobium, Agrobacterium)
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	characteristics of Mycobacterium and Mycoplasmas, Disinfectants; Types of toxins and their mode of action.
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	photosynthetic prokaryotes (purple bacteria, green bacteria, cyanobacteria) and actinomycetes
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Microbiology

Paper- Paper BT-102

Class- M.Sc. Semester – I

2 nd week 10 Jan – 15 Jan	brief account of different types of viruses with special reference to lambda phage, herpes, adenoviruses and retroviruses, virioids and prions; fungi and algae of industrial importance.
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	Sterilization methods- dry heat, moist heat, radiations, filtration, gaseous sterilization, Validation of sterilization processes;

23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	Factors affecting antimicrobial action, Mode of action of antimicrobial agents, Antibiotics and their mode of action, Microbiological assay of antibiotics (ampicillin, streptomycin, tetracycline etc.),
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	Microbial ecology: Biogeochemical cycles; Physical environment: Microenvironment & Niche Microorganisms and ecosystems. Soil microbiology: Types & functions of microorganisms in soil.
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	Microorganism associations with vascular plants (Mycorrhizae, rhizobia)
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Microorganism growth in goods, good spoilage & control, good born diseases.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Genetics

Paper- Paper BT-114

Class- M.Sc. Biotechnology Semester - III

October, 2021 2 rd Week 11 Oct-16 Oct	Packaging of DNA into chromosomes, Special features of metaphase chromosomes, Chromosome banding, Genome size and complexity
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	Gene organization, Multigene families, Pseudo genes, Repetitive DNA, Chromatin domains, Chromatin modifications
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	An overview of mutation and polymorphism, VNTR polymorphism, Hot spots, DNA damage- spontaneous, Induced (Alkylation, oxidation, radiation),

31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	Genotoxicity/ mutagenicity test systems (Ames test, Sister chromatid exchanges, Micronucleus, Comet assay), Signature Tagged Mutagenesis (STM),
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Gene trap vector, Gene conversion.
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Positive and negative control of transcription, Repression and activation, Organization and regulation of Lac, Trp and Ara operon in <i>E. coli</i> .

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Genetics

Paper- Paper BT-114

Class- M.Sc. Biotechnology Semester - III

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Organization of genome in lambda phage, Regulation of lytic cascade, Antitermination, Repressor proteins,
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Establishment of lysogeny, Balance between lysogeny and lytic cycle.
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	Eukaryotic activators, DNA binding domains, Transcriptional repressors, Signal transduction and control of transcriptional regulators
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	Gene silencing, Epigenetic gene regulation
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	

	Riboswitches, Interfering RNA (RNAi) and gene expression, Short interfering RNA (si RNA) and its functions, Micro RNA and its functions, Antisense RNA and gene expression
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	Concept, Recombinases and their function, cre-lox recombination, Biological role of site specific recombination, Classes of transposable elements-DNA transposons
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Manpreet Kaur

Subject- Molecular Genetics

Paper- Paper BT-114

Class- M.Sc. Biotechnology Semester - III

2 nd week 10 Jan – 15 Jan	Virus like transposons, Non viral retro transposons, Mechanism of DNA and RNA mediated transposition
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	Shot gun approach, Clone contig approach, DNA markers for genetic mapping, RFLP, SSP, SNPs, Physical mapping-Restriction mapping,
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	Florescent <i>in situ</i> hybridization (FISH), Sequence tagged sites (STS) mapping
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 31 Jan -4 Feb	High throughput sequencing, Clone by clone approach, whole genome shot gun sequencing
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	Concept, Comparative genomics of eukaryotes and its role in evolution
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Transcriptome, Rapid Amplification of cDNA ends (RACE), SAGE, DNA microarrays

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms.SONIKA

Subject ANIMAL BIOTECHNOLOGY

Paper- Paper XI

Class- B.sc IIIrd BIOTECHNOLOGY SEMESTER Vth

October, 2021 2 nd Week 7,8, 9 ,Oct,2021	Animal Cell & Tissue Culture: Introduction, Principles & practice. History and Development of animal cell culture. Scope and Applications
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 14,21,Oct 2021	Culture Media: Media components, Serum containing and serum free media. Natural mediaPlasma clot, biological fluids, tissue extracts
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct 28,29,30 oct,2021	Growth factors required for proliferation of animal cells. Chemically defined media, balanced salt solutions
31 Oct, 2021	Sunday
November, 2021 1 st Week 4,5,6 Nov 2021	(Haryana Day) Diwali Holidays Diafiltration and their applications,
2nd Week 11,12,13 Nov 2021	Physical requirements for growing animal cells in culture. Washing, drying, sterilization practices
14 Nov, 2021	Sunday
3 rd Week 18,19,20 Nov 2021	Washing, drying, sterilization practices, various instruments and their uses in animal cell culture practices.
21 Nov, 2021	Sunday
4 th Week 25,26,27 Nov 2021	Primary Cell Culture techniques: Initiation of cell culture-substrates (glass, plastic, metals) their preparation and sterilization

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. SONIKA

Subject- –Paper- INTRODUCTION TO BIOTECHNOLOGY

Class- B.sc Ist BIOTECHNOLOGY SEMESTER Ist

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 2,3,4 Dec 2021	Isolation of tissue explants, disaggregation- enzyme disaggregation and mechanical disaggregation of the tissue
05 Dec, 2021	Sunday
2 nd Week 9,10,11 Dec 2021	development of primary culture and cell lines. Subculture. Contamination.. Suspension culture, Growth curve of animal cells in culture. Secondary cell culture – transformed cell and continuous cell lines.
12 Dec,2021	Sunday
3 rd week 16,17,18 Dec 2021	Finite and infinite cell lines. Cell lines: Insect and animal cells. Commonly used cell lines-
19 Dec,2021	Sunday
4 th Week 23,24 Dec 2021	characteristics. Cell repositories and their function. Karyotyping, biochemical and genetic characterization of cell lines
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 01 Jan 2022	Organ Culture: technique, advantages, applications and limitations. Artificial skin
2 Jan ,2022	Sunday
Jan ,2022 1 st week 6,7,8 Jan 2022	Transfection of animal cells: transfection method
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Ms. SONIKA

Subject- INTRODUCTION TO BIOTECHNOLOGY

Paper- Ist

Class- B.sc Ist BIOTECHNOLOGY SEMESTER Ist

2 nd week 13,14, 15 Jan	Methods for cell fusion, Selectable markers,
16 Jan ,2022	Sunday
3 rd week 20,21,22 Jan	HAT selection and Antibiotic resistance
23 Jan ,2022	Sunday
4 th Week 27,28, 29 Jan	Cloning and expression of foreign genes in animal cells:
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday Diafiltration and their applications,types
Feb, 2021 1 st week 3,4,5 Feb	Expression vectors. Over production and preparation of the final product i.e. expressed proteins
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 10,11, 12 Feb	Production of vaccines in animal cells. Hybridoma Technology: Production of monoclonal antibodies and their applications.
13 Feb ,2022	Sunday
3 rd week 17,18,19 Feb	Embryo transfer technology- technique, its applications. Artificial insemination. Animal clones. Transgenic Animals: transgenic sheep, cow, pig, goat etc. Production of transgenic mice, ES cells can be used for gene targeting in mice, applications of gene targeting.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms.SONIKA

Subject- INTRODUCTION TO BIOTECHNOLOGY

Paper- Paper Ist

Class- B.sc Ist BIOTECHNOLOGY SEMESTER Ist

October, 2021 2 rd Week 11,12,13 Oct	Definition & scope of Biotechnology; introduction of genetic engineering; fermentation technology
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18,19,20 Oct	immobilized enzymes; monoclonal antibodies embryo transfer technology
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 ,26,27 Oct	Introduction to gene and genomes
31 Oct, 2021	Sunday
November, 2021 1 st Week 1,2,3 Nov	(Haryana Day) Diwali Holidays
2nd Week 8 ,9,10 Nov	history of genetic manipulations recombinant DNA technology,
14 Nov, 2021	Sunday
3 rd Week 15,16,17 Nov	recombinant DNA technology,Principle
21 Nov, 2021	Sunday
4 th Week 22,23,24 Nov	DNA fingerprinting, forensic analysis.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. SONIKA

Subject- –Paper- INTRODUCTION TO BIOTECHNOLOGY

Class- B.sc Ist BIOTECHNOLOGY SEMESTER Ist

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 1 Dec	Application of biotechnology animal and veterinary sciences,
05 Dec, 2021	Sunday
2 nd Week 06,7,8 Dec	food industry, chemical industry.
12 Dec,2021	Sunday
3 rd week 13,14,15 Dec	Bioremediation and waste treatment biotechnology
19 Dec,2021	Sunday
4 th Week 20,21,22 Dec	Biotechnology research in India.
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27,28,29 Jan	Biotechnology in context of developing world
2 Jan ,2022	Sunday
Jan ,2022 1 st week 1Jan	Brief account of safety guidelines and risk assessment in biotechnology. Ethics in Biotechnology,
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Ms. SONIKA

Subject- INTRODUCTION TO BIOTECHNOLOGY

Paper- Ist

Class- B.sc Ist BIOTECHNOLOGY SEMESTER Ist

2 nd week 3,4,5 Jan	Intellectual property rights.
16 Jan ,2022	Sunday
3 rd week 10,11,12 Jan	TRADE MARK TYPES
23 Jan ,2022	Sunday
4 th Week 24,25 Jan	TRADE SECERATE
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2022 1 st week 1,2,3 Feb	PLANT BREEDER RIGHT
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 8,9,10 Feb	TYPES OF PLANT BREEDER TYPES
13 Feb ,2022	Sunday
3 rd week 14,15,16 Feb	WHO RULES REGARDING PBR

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms.SONIKA

Subject- MICROBIAL BIOTECHNOLOGY

Paper- Paper BT-116

Class- M.SC IInd BIOTECHNOLOGY SEMEMSTER 3rd

October, 2021 2 nd Week 11 Oct-16 Oct	Microbial Biotechnology: Scopes application and challenges. Isolation preservation and improvement of industrially Overproduction of primary and secondary metabolites.
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	preservation and improvement of industrially important microorganisms. Kinetics of microbial growth and product formation. Fermentation system; batch and continuous system, fed batch system, multistage system
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	Fermentation raw materials:Types SSF
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	Media for industrial fermentations; criteria used in media formulation. Fermenter/bioreactor design and operation; types of fermentor, stirred tank reactor, (Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	bubble column reactor, airlift reactor, packed bed reactor, fluidized bed reactor and trickle bed reactor, agitation and aeration in a reactor,
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	mass transfer. Foam formation and Control Industrial production of alcohol
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Ethanol, wine and beer

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. SONIKA

Subject- – MICROBIAL BIOTECHNOLOGY

Paper- BT-116

Class- M.SC IInd BIOTECHNOLOGY SEMEMSTER 3rd

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Microbial production of acids (citric, acetic acid) glycerol acetone and butanol) aminoacids
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Production of antibiotics
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	Penicillin and cephalosporin
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	mass transfer methods
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	industrially important microorganisms
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	system; batch and continuous system, fed batch system, multistage system
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Ms. SONIKA

Subject- MICROBIAL BIOTECHNOLOGY

Paper- BT-116

Class- M.SC IInd BIOTECHNOLOGY SEMEMSTER 3rd

2nd week 10 Jan – 15 Jan	Industrial production of alcohol (ethanol, wine and beer) and improvement by genetic engineering
16 Jan ,2022	Sunday
3rdweek 17 Jan – 22 Jan	Microbial production of acid, GLYCEROL, CITRIC ACID

23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	Microbial polysaccharides Fermentative production of xanthan gums,. Bacterial bioplastics, genetic engineering of microorganisms for the production of poly-3 hydroxyalkanoates.
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	Microbial inoculants: Food starter cultures; baker’s yeast, starter cultures baker’s yeast, starter cultures meat starter cultures
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	Biomass production Single cell protein (SCP) production
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Microbial transformation of steroids and steroids.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms.SONIKA

Subject- MOLECELL BIOLOGY

Paper- Paper BT-103

Class- M.SC Ist BIOTECHNOLOGY SEMEMSTER Ist

October, 2021 2 rd Week 11 Oct-16 Oct	Overview of cells and cell research: Origin and evolution of cells, Cells as experimental models, tools of cell biology. Fundamentals of Molecular Biology: Heredity, Genes, and DNA, Expression of Genetic Information, Recombinant DNA, Detection of Nucleic Acids and Proteins, Gene Function in Eukaryotes
--	---

15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	organization of the nucleus, nucleolus, nucleus during mitosis. Nucleus: Nuclear envelope and traffic Protein Sorting and Transport
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	Protein Sorting and Transport: Endoplasmic reticulum, Golgi apparatus, and Lysosomes, mechanism of vesicular transport
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	DNA polymerases, replication fork, fidelity of replication, replication at the ends of chromosomes (Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	DNA Repair: Direct reversal of DNA damage, excision repair, error-prone repair, recombinational repair.
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	RNA Synthesis and Processing: Prokaryotic transcription, Eukaryotic transcription.
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Prokaryotic transcription, Eukaryotic transcription RNA polymerases and transcription factors, RNA processing and turnover,

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. SONIKA

Subject- – MOLCELL BIOLOGY

Paper- BT-103

Class- M.SC Ist BIOTECHNOLOGY SEMESTER Ist

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Protein Synthesis, Processing and Regulation: Translation of mRNA, Protein folding and processing, regulation of protein function, protein degradation
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Cell Signaling: Signaling molecules and their receptors, functions of cell surface cytoskeleton, signaling in development and differentiation.
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	Protein degradation
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	Cell death and cell renewal
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	Programmed cell death, stem cells and maintenance of adult tissues. Embryonic stem cells and therapeutic cloning.
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	Cancer
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Ms. SONIKA

Subject- MOLCELL BIOLOGY**Paper- BT-103****Class- M.SC Ist BIOTECHNOLOGY SEMESTER Ist**

2 nd week 10 Jan – 15 Jan	Detection of Nucleic Acids and Proteins,
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	signal transduction
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	, signaling in development and differentiation
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	Embryonic stem cells and therapeutic cloning
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	suppressor genes, application of molecular biology to cancer prevention and treatment
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Development and causes of cancer, tumor viruses, oncogenes,

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biochemistry

Paper- II

Class- B.Sc. I

October, 2021 2 rd Week 14 Oct-16 Oct	Biomolecules: Introduction, important features, covalent and non-covalent interactions. Carbohydrates: Introduction and Biological Significance.
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 21 Oct-23 Oct	Definition and classification: Monosaccharides; families of monosaccharides; simple aldoses and ketoses, Configuration and Conformation, Stereoisomerism/ Asymmetric centres TEST TOPIC DISCUSSION
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 28 Oct-30 Oct	Fischer and Haworth projection formula, pyranose and furanose ring forms, reducing and non-reducing sugars Sugar derivatives viz. sugar alcohols, amino sugars, deoxy sugars, acidic sugars TEST TOPIC DISCUSSION
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 11 Nov-13 Nov	Glycosidic bond Disaccharides and Oligosaccharides: Definition, structure and function of important di and oligosaccharides viz. lactose, sucrose, maltose TEST TOPIC DISCUSSION

14 Nov, 2021	Sunday
3 rd Week 18 Nov-20 Nov	raffinose, stachyose, verbascose etc. Polysaccharides: Homo and Hetero polysaccharides, storage polysaccharides: Starch and Glycogen TEST TOPIC DISCUSSION
21 Nov, 2021	Sunday
4 th Week 25 Nov-27	Structural polysaccharides: Cellulose and Chitin TEST TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biochemistry

Paper- II

Class- B.Sc. I

28 Nov, 2021	Sunday
1 st Week 02 Nov-04 Dec	A brief account of structure and function of mucopolysaccharides/Glycosaminoglycans (Hyaluronic acid, Chondroitin sulphate) TEST TOPIC DISCUSSION
05 Dec, 2021	Sunday
2 nd Week 09 Dec -11 Dec	Glycoproteins and Proteoglycans. Amino acids TEST TOPIC DISCUSSION

12 Dec,2021	Sunday
3 rd week 16 Dec -18 Dec	Peptides and Proteins: Classification and structure of amino acids, essential amino acids, rare and non-protein amino acids, optical and chemical properties of amino acids Acidbase behaviour/zwitterions pKa value and titration curve TEST TOPIC DISCUSSION
19 Dec,2021	Sunday
4 th Week 23 Dec-24 Dec	Proteins: Classification based on structure and function. Structural organization of proteins: Primary structure; Secondary structure- α -Helix, β - pleats and β – turn Tertiary structure – myoglobin and lysozyme etc. Quaternary structure-hemoglobin. Forces stabilizing different structural levels TEST TOPIC DISCUSSION
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 30 Dec -01 Jan	Amino acid analysis/N-terminal amino acid analysis- Sanger's method, Edmann's degradation, dansyl chloride and dabsyl chloride TEST TOPIC DISCUSSION
2 Jan ,2022	Sunday
Jan ,2022 1 st week 6 Jan – 8 Jan	Lipids: Introduction and Classification – simple and complex lipids, Fatty acids – structure and nomenclature, soap value, acid value, iodine number, rancidity. Essential fatty acids TEST TOPIC DISCUSSION
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biochemistry

Paper- II

Class- B.Sc. I

2 nd week 13 Jan – 15 Jan	A general account of structure and function of triacylglycerols, phospholipids, glycolipids TEST TOPIC DISCUSSION
16 Jan ,2022	Sunday
3 rd week 20 Jan – 22 Jan	Sphingolipids Steroids Bile acids Bile salts Terpenes TEST TOPIC DISCUSSION
23 Jan ,2022	Sunday
4 th Week 27 Jan – 29 Jan	Nucleotides and Nucleic acids: Building blocks: bases, sugars and phosphates TEST TOPIC DISCUSSION
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 3 Feb-4 Feb	Structure and nomenclature of nucleosides and nucleotides; polynucleotides, DNA (A,B, ZDNA) and RNA (rRNA, mRNA, tRNA) TEST TOPIC DISCUSSION
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 10 Feb- 12 Feb	Properties of DNA – absorption, denaturation, renaturation, hybridization, T _m /Cot values TEST TOPIC DISCUSSION
13 Feb ,2022	Sunday
3 rd week 17 Feb- 19 Feb	Biologically important nucleotides and their functions – ATP, GTP, Coenzyme A, NAD, FAD and cAMP TEST TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- VI

Class- B.Sc. II

October, 2021 2 nd Week 11 Oct-13 Oct	Immunology: Introduction, History and Scope. Terminology of immune system Immunity: Definition, types of Immunity- Innate, Adaptive/acquired (active, passive, natural/artificial)
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-20 Oct	Humoral and Cell mediated immunity) Features of Immune Response –memory, cell specificity/diversity, recognition of self and non-self TEST TOPIC DISCUSSION
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-27 Oct	Cells of the Immune System – B and T cells (types and receptors) TEST TOPIC DISCUSSION
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-10 Nov	Null cells Monocytes, Polymorphs TEST TOPIC DISCUSSION
14 Nov, 2021	Sunday

3 rd Week 15 Nov-17 Nov	Organs of the Immune System: Primary and Secondary Lymphoid organs- Thymus Spleen Lymph nodes TEST TOPIC DISCUSSION
21 Nov, 2021	Sunday
4 th Week 22 Nov-24	Antigens: Concept, Types of Antigens Antigenic determinants/epitopes Hapten. Antigen Immunogen TEST TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- VI

Class- B.Sc. II

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-01 Dec	Antigenicity and Immunogenicity. Factors affecting antigenicity. Antibodies: Structure, Types/Classes, properties and functions of immunoglobulins TEST TOPIC DISCUSSION
05 Dec, 2021	Sunday
2 nd Week 06 Dec -08 Dec	Production of antibodies. Antibody diversity (a brief account only). Antigen – Antibody Interactions: Binding sites, Binding forces, Affinity, Avidity, Cross reactions TEST TOPIC DISCUSSION
12 Dec,2021	Sunday
3 rd week 13 Dec -15 Dec	Precipitation and Agglutination reactions RIA ELISA TEST TOPIC DISCUSSION
19 Dec,2021	Sunday
4 th Week 20 Dec-22 Dec	Immune Response: Introduction Humoral Immunity – Primary and Secondary immune response TEST

	TOPIC DISCUSSION
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -29 Jan	B cells in antibody formation (differentiation, maturation and activation of B cells) TEST TOPIC DISCUSSION
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 5 Jan	Role of MHC molecules Antigen presenting cells Factors influencing antibody formation TEST TOPIC DISCUSSION
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- VI

Class- B.Sc. II

2 nd week 10 Jan – 12 Jan	Cell mediated immunity- Cells involved in CMI, (T-cell subset and surface markers T-dependent and T-independent antigens TEST TOPIC DISCUSSION
16 Jan ,2022	Sunday
3 rd week 17 Jan – 19 Jan	recognition of antigens by T-cells Role of MHC and MHC restriction) Cytokines and lymphokines Functions of cell mediated immunity TEST TOPIC DISCUSSION
23 Jan ,2022	Sunday
4 th Week 24 Jan – 25 Jan	Complement system: Structure, components, properties and functions TEST TOPIC DISCUSSION

26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-2 Feb	Major Histocompatibility Complex- Class I and Class II MHC molecules, functions of MHC TEST TOPIC DISCUSSION
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 9 Feb	Hypersensitivity and allergic reactions. (Brief only) Autoimmunity, immunological tolerance TEST TOPIC DISCUSSION
13 Feb ,2022	Sunday
3 rd week 14 Feb- 15 Feb	Vaccines: concept, types of vaccines- Inactivated, Attenuated and Recombinant vaccines (Peptide and DNA vaccines) TEST TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biomolecules

Paper- BT-101

Class- M.Sc. I

October, 2021 2 nd Week 11 Oct-16 Oct	Water : Structure Hydrogen bonding of Water Water as a biological solvent
--	--

15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	Ionization and fitness of the aqueous environment for living organisms pH Buffers TEST TOPIC DISCUSSION
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	Henderson-Hasselbalch Equation Physiological buffers Carbohydrates : Structure TEST TOPIC DISCUSSION
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	Occurrence and biological importance of important Monosaccharides Oligosaccharides Polysaccharide Ring structure Anomeric forms Mutarotation TEST TOPIC DISCUSSION
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Sugar derivatives Reactions of monosaccharides Glycosaminoglycans TEST TOPIC DISCUSSION
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Heteropolysaccharides of bacterial and algal cell walls; Proteoglycans Glycoproteins Lectin

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biomolecules

Paper- BT-101

Class- M.Sc. I

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Glycoproteins Lectin Amino acids and Proteins : Common structural features, classification by R group, Zwitter ion structures Acid-base properties and titration curves of amino acids Essential amino acids
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Separation of amino acids TEST TOPIC DISCUSSION
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	Peptides including biologically active peptides Classification and different structural levels (Primary, secondary,tertiary & quaternary) of proteins Ramachandran plot TEST TOPIC DISCUSSION
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	Determination of amino acid composition of proteins Characteristic amino acid composition of proteins; Determination of amino acid sequences of proteins TEST TOPIC DISCUSSION
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	Effect of amino acid sequence on the function of a protein and stability of α -helix Protein folding and role of chaperons in protein folding Chemical synthesis of polypeptides. TEST TOPIC DISCUSSION

2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	Lipids : Classification Structures Nomenclature properties of fatty acids Essential fatty acid Acylglycerols TEST TOPIC DISCUSSION
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biomolecules

Paper- BT-101

Class- M.Sc. I

2 nd week 10 Jan – 15 Jan	Characterization of fats-Saponification value, Iodine number Rancidity Acid value,Reichert-Meissel number Structures and properties of different types of phospholipids TEST TOPIC DISCUSSION
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	Structures and properties of different types of sphingolipids Structures and properties of different types of prostaglandins Prostacyclins Thromboxanes Leukotrienes TEST TOPIC DISCUSSION
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	

	<p>Terpenes of biological significance Sterols bile acids Nucleic Acids : Structure TEST TOPIC DISCUSSION</p>
<p>26 Jan, 2022 30 Jan ,2022</p>	<p>Republic Day Sunday</p>
<p>Feb, 2021 1st week 1 Feb-4 Feb</p>	<p>Properties of purines and pyrimidine bases; Nucleosides and Nucleotides Biologically important nucleotides Nucleic acids as the genetic material – experimental evidences Chargaff's rules TEST TOPIC DISCUSSION</p>
<p>5 Feb, 2022 6 Feb ,2022</p>	<p>Vasant Panchmi Sunday</p>
<p>2nd week 7 Feb- 12 Feb</p>	<p>The covalent backbone of nucleic acids Double helical model of DNA structure Structural polymorphism of DNA (A,B and Z-DNA) RNA TEST TOPIC DISCUSSION</p>
<p>13 Feb ,2022</p>	<p>Sunday</p>
<p>3rd week 14 Feb- 19 Feb</p>	<p>Denaturation & annealing of DNA Biological functions of nucleotides Chemical synthesis of oligonucleotides TEST TOPIC DISCUSSION</p>

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- BT-117

Class- M.Sc. II

October, 2021 2 nd Week 11 Oct-16 Oct	Introduction and overview of immunology Cells of immune system Innate and cellular immunity Physical and chemical barriers Cellular defenses Inflammation
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	Receptors involved in innate immune system Cells involved in adaptive immune response Organs involved in adaptive immune response
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	Fate of antigen after penetration Interrelationship between innate and acquired immunity Requirements of immunogenicity Doubt Classes
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	Primary and secondary responses Major classes of antigens Basic structure of antibodies Antibody classes
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Antibody biological activity Antigenic determinants on immunoglobulin Immunoglobulin super family Doubt Classes TEST
21 Nov, 2021	Sunday

4 th Week 22 Nov-27	Organization and expression of immunoglobulin genes Antigen-antibody interactions Immunoprecipitation Agglutination ELISA
-----------------------------------	---

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- BT-117

Class- M.Sc. II

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Antigen-antibody interactions Immunoprecipitation Agglutination ELISA
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Immunofluorescence Flow cytometry Doubt Classes TEST
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	<i>Biology of B lymphocytes</i>
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	<i>Biology of B lymphocytes</i>
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	<i>Biology of Tcells</i>
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	<i>Biology of Tcells</i>
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Immunology

Paper- BT-117

Class- M.Sc. II

2 nd week 10 Jan – 15 Jan	Role of major histocompatibility complex in immune response Cytokines Doubt Classes TEST
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	Complement system Doubt Classes
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	<i>Hybridoma technology</i> Commercial production of antibodies using monoclonal Antibodies <i>Vaccines</i> Live attenuated Killed
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	Subunit Conjugate DNA vaccines
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	Production of recombinant antibodies and edible vaccines Development of diagnostics and immunoprophylactics using biotech and nanotech tools
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Syllabus revision TEST

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda

Subject- Plant Biotechnology

Paper- Paper XII

Class- B.Sc. Biotechnology Semester- V

October, 2021 2 nd Week 11 Oct-13 Oct	Introduction/Concept, History, Scope and Applications along with major achievements. Plant Tissue Culture Laboratory: Layout and organization, different work areas, infrastructure/equipments and instruments and other requirements.
15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-20 Oct	Aseptic Techniques: General sanitation/cleanliness of PTC laboratory and precautions regarding maintenance of aseptic conditions, Washing, drying and sterilization of glassware, sterilization of media, surface sterilization, aseptic work station.
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-27 Oct	Culture Media: Nutritional requirements for plant tissue culture, role of different media components, plant growth regulators
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2 nd Week 8 Nov-10 Nov	Different culture media viz. MS, B ₅ Nitsch and White's medium, Preparation of culture media
14 Nov, 2021	Sunday
3 rd Week 15 Nov-17 Nov	In-vitro methods in plant tissue culture: Explants, their cellular characteristics, dedifferentiation and redifferentiation, cellular totipotency, organogenesis and somatic embryogenesis
21 Nov, 2021	Sunday
4 th Week 22 Nov-24 Nov	Micropropagation/clonal propagation of elite species (different routes of multiplication-axillary bud proliferation, somatic embryogenesis, organogenesis)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester

(October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda
Subject- Plant Biotechnology
Paper- Paper XII
Class- B.Sc. Biotechnology Semester- V

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-01 Dec	Callus and suspension culture techniques: Introduction, principle, methodology, applications and limitations. Somaclonal variation.
05 Dec, 2021	Sunday
2 nd Week 06 Dec -08 Dec	Organ culture: Anther & Pollen culture, ovary, ovule, embryo and endosperm culture – concept, technique, applications and limitations. Embryo rescue.
12 Dec,2021	Sunday
3 rd week 13 Dec -15 Dec	Protoplast culture: Protoplast isolation, viability test, protoplast culture. Somatic hybridization –protoplast fusion techniques (chemical and electro-fusion), selection of hybrids
19 Dec,2021	Sunday
4 th Week 20 Dec-22 Dec	production of symmetric and asymmetric hybrids and cybrids.
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -29 Jan	Synthetic seeds (a brief account)
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 5 Jan	Practical applications of somatic hybridization and cybridization. Production of secondary metabolites in vitro: introduction, technique and utilities
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda
Subject- Plant Biotechnology
Paper- Paper XII
Class- B.Sc. Biotechnology Semester- V

2 nd week 10 Jan – 12 Jan	Biotransformation (a brief account only). Plant germ plasm conservation and cryopreservation
16 Jan ,2022	Sunday

3 rd week 17 Jan – 19 Jan	Introduction, Plant transformation by <i>Agrobacterium tumefaciens</i> and <i>A. rhizogenes</i> . Ti plasmid. Strategies for gene transfer to plant cells. Binary and cointegrate vectors. Gene targeting in plants. Use of plant viruses as vectors (brief account only).
23 Jan ,2022	Sunday
4 th Week 24 Jan – 26 Jan	Direct DNA transfer/Physical methods of gene transfer in plants - micro projectile bombardment, electroporation, liposome mediated, Calcium phosphate mediated etc.
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 31 Jan -2 Feb	Transgenic Plants: Introduction and applications. Developing insect resistance, bacterial and fungal disease resistance, virus resistance and abiotic stress tolerance in plants
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 09 Feb	Improving food quality – nutritional enhancement of plants (carbohydrates, seed storage proteins and vitamins).
13 Feb ,2022	Sunday
3 rd week 14 Feb- 16 Feb	Plants as Bioreactors: antibodies, polymers, industrial enzymes. Edible vaccines.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – MS.RAKSHANDHA

Subject- Biotechniques

Paper- Paper BT-104

Class- M.SC Ist BIOTECHNOLOGY SEMEMSTER Ist

October, 2021 2 rd Week 11 Oct-16 Oct	Cell Separation, disruption, extraction and concentration techniques: Microfiltration, Centrifugation, Ultrasonication, High pressure Homogenisation, Bead Milling, Ultrafiltration,
15 Oct, 2021	(Dussehra)

17 Oct, 2021	Sunday
3 th Week 18 Oct-23 Oct	Diafiltration and their applications, reverse osmosis Centrifugation Method
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	differential centrifugation, density gradient and ultracentrifugation Microscopy: Light Microscopy – Magnification, Resolving power, Numerical aperture, Limit of Resolution
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	transmission electron microscopy. (Haryana Day) Diwali Holidays
2 nd Week 8 Nov-13 Nov	Spectroscopy: Principles of biophysical methods used for analysis of biopolymer structure -X-ray diffraction, fluorescence spectroscopy, Atomic absorption and Atomic emission spectroscopy.
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Chromatography: Principles and applications of Paper, Thin layer, Gel-filtration, ion-exchange, Af
21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Affinity chromatography, Gas liquid chromatography, High pressure liquid chromatography (HPLC); Reversed Phase chromatography ,Hydrophobic interaction chromatography.

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms.

Subject- – **Biotechniques**

Paper- BT-104

Class- M.SC Ist BIOTECHNOLOGY SEMESTER Ist

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Electrophoresis: Concept, Factors affecting electrophoresis,
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Pulse field gel electrophoresis 2 Dimentional electrophoresis
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	PAGE, SDS-PAGE,

19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh's Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher –

Subject- **Biotechniques**

Paper- **BT-104**

Class- **M.SC Ist BIOTECHNOLOGY SEMESTER Ist**

2 nd week 10 Jan – 15 Jan	
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	

26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda Singh

Subject- Plant Biotechnology

Paper- BT-115

Class- M.Sc. II

October, 2021 2 nd Week 11 Oct-16 Oct	Plant genetic transformation: Organization of plant genome – Nuclear genome Chloroplast genome mitochondrial genome Transposon and T – DNA tagging.
--	--

15 Oct, 2021 17 Oct, 2021	(Dussehra) Sunday
3 th Week 18 Oct-23 Oct	Chloroplast transformation vector designing method and advantages <i>Agrobacterium</i> mediated transformation Ti and Ri plasmids TEST TOPIC DISCUSSION
20 Oct, 2021 24 Oct, 2021	Maharishi Valmiki Jayanti Sunday
4 th Week 25 Oct-30 Oct	Role of virulence genes, Mechanism of T-DNA transfer Vectors based on Ti and Ri plasmids Cointegrate and binary vectors Technique and factors affecting <i>Agrobacterium</i> mediated transformation of plants. TEST TOPIC DISCUSSION
31 Oct, 2021	Sunday
November, 2021 1 st Week 1 Nov-7 Nov	(Haryana Day) Diwali Holidays
2nd Week 8 Nov-13 Nov	Direct gene transfer particle bombardment PEG-mediated electroporation, microinjection alternative methods TEST TOPIC DISCUSSION
14 Nov, 2021	Sunday
3 rd Week 15 Nov-20 Nov	Screenable and selectable markers Molecular characterization of transformants. Marker free methodologies Methods for multiple gene transfer in plants Gene silencing in transgenic plants TEST TOPIC DISCUSSION

21 Nov, 2021	Sunday
4 th Week 22 Nov-27	Strategies for introducing biotic and abiotic stress resistance/tolerance: Viral resistance

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda Singh

Subject- Plant Biotechnology

Paper- BT-115

Class- M.Sc. II

28 Nov, 2021	Sunday
Dec, 2021 1 st Week 29 Nov-04 Dec	Fungal resistance Insect resistance Herbicide resistance TEST TOPIC DISCUSSION
05 Dec, 2021	Sunday
2 nd Week 06 Dec -11 Dec	Various abiotic stresses Drought Salinity Temperature Flooding TEST TOPIC DISCUSSION
12 Dec,2021	Sunday
3 rd week 13 Dec -18 Dec	Genetic engineering of plants for molecular farming/pharming Production of medically related proteins in plants Nutritional enhancement of plants: carbohydrates Seed storage proteins TEST TOPIC DISCUSSION
19 Dec,2021	Sunday
4 th Week 20 Dec-24 Dec	Vitamins manipulation of flower colors and other value addition compounds (like industrial enzymes)

	Production of useful secondary metabolites through plant cell cultures TEST TOPIC DISCUSSION
25 Dec,2021 26 Dec,2021	Christmas Sunday
5 th Week 27 Dec -01 Jan	Strategies used for high yield of product – development and selection of high yielding cell line cultures, optimization of factors affecting yield of plant cells (physical culture conditions, media and other biochemicals) TEST TOPIC DISCUSSION
2 Jan ,2022	Sunday
Jan ,2022 1 st week 3 Jan – 8 Jan	Different Types of Bioreactors immobilized plant cell culture TEST TOPIC DISCUSSION
9 Jan ,2022	Sunday(Sh. Guru Gobind Singh’s Birthday)

KVA DAV College for Women, Karnal

Lesson plan for the odd semester (October, 2021 to February, 2022)

Name of the Teacher – Ms. Rakshanda Singh

Subject- Plant Biotechnology

Paper- BT-115

Class- M.Sc. II

2 nd week 10 Jan – 15 Jan	Biotransformation Permeabilization of cells Removal of secreted products TEST TOPIC DISCUSSION
16 Jan ,2022	Sunday
3 rd week 17 Jan – 22 Jan	Intellectual Property Rights, Biosafety and Ethical Issues – Intellectual property rights (IPR) Patents

	Trade secrets Copyright Trademarks; TEST TOPIC DISCUSSION
23 Jan ,2022	Sunday
4 th Week 24 Jan – 29 Jan	Plant genetic resources; GATT & TRIPPS Patenting of biological material TEST TOPIC DISCUSSION
26 Jan, 2022 30 Jan ,2022	Republic Day Sunday
Feb, 2021 1 st week 1 Feb-4 Feb	Patenting of transgenic organisms and genes Plant breeders rights (PBRs) and farmers rights TEST TOPIC DISCUSSION
5 Feb, 2022 6 Feb ,2022	Vasant Panchmi Sunday
2 nd week 7 Feb- 12 Feb	Concerns about GM crops – environmental,biosafety and ethics TEST TOPIC DISCUSSION
13 Feb ,2022	Sunday
3 rd week 14 Feb- 19 Feb	Syllabus Revision

