

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- M.Sc. Biotechnology Semester – II
Subject- Principles of Genetic Engineering
Paper- BT-107

2 nd Week 9Feb -11Feb	Introduction and scope of Genetic Engineering, Miles stones in Genetic engineering, Central role of <i>E.coli</i> .
12Feb, 2023	Sunday
3 rd Week 13Feb -17 Feb	Purification of total cell DNA, plasmid DNA, phage DNA, Yield Analysis, Nucleic acid blotting and hybridization
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -25 Feb	DNA modifying enzymes- Terminal deoxynucleotidyl transferase, Polynucleotide kinase, Alkaline phosphatase, Nucleases, Methylases Restriction Endonucleases- Host controlled restriction and modification, Nomenclature, types, Recognition sequence, blunt and sticky ends, applications.
26 Feb, 2023	Sunday
5 th Week 27 Feb -28 Feb	Ligases- <i>E. coli</i> and T4 DNA ligases, Linker, Adaptor, Homopolymer tailing Gene Cloning Vectors General features, Types of cloning vectors- Plasmid, bacteriophage, phagemid, cosmid, artificial chromosomes (YAC, BAC, PAC)

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Name of the Teacher – Dr. Twinkle Sugla
Class- M.Sc. Biotechnology Semester – II
Subject- Principles of Genetic Engineering
Paper- BT-107

March, 2023 1 st Week 1March -4 March	Concept, Selection of transformed cells, Identification of recombinants (bacteria and phages) Cloning of Specific Gene- Direct selection, Identification from a gene library-genomic library
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	cDNA synthesis and cloning-Properties of cDNA, mRNA enrichment, cDNA library.
19 March,2023	Sunday
4 th Week 20March-25 March	Screening strategies- Colony and plaque hybridization, Abundance probing, Heterologous probing, Immunological screening, Differential screening,
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 31 March	Subtractive hybridization. Protein-Protein interactions- Phage display, Yeast two hybrid system, Yeast three hybrid system. DNA Sequencing: Rapid DNA sequencing techniques

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April, 2023 1st Week 1 April, 2023	and strategic details of range of methodologies eg. Dideoxyribonucleotide, Chemical degradation, Automated DNA sequencing, Thermal cycle sequencing, Pyrosequencing. Concept, Basic PCR reaction, Factors affecting the PCR, Types of PCR: RT-PCR,
2 April, 2023	Sunday
2nd Week 3 April -8 April	Real time PCR, Allele specific PCR, Multiplex PCR) , Applications of PCR Site Directed Mutagenesis Oligonucleotide directed mutagenesis, PCR amplified oligonucleotide directed mutagenesis, Random mutagenesis with degenerate oligonucleotide primers / nucleotide analogs.
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3rd Week 10April - 15April	Primer extension, S1 mapping, RNase protection assay, Gel retardation assay, Deletion analysis, Reporter genes, DNA foot printing, Modification interference assays, HRT, HART
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4thWeek 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-UI-Fitr/ParshuramJayanti Sunday
5thWeek 24 April -29 April	Optimizing expression of foreign genes in <i>E.coli</i> - Strong and regulatory promoters, Codon usage, Fusion proteins, Increasing protein stability and secretion, Translation expression vectors, Protease deficient host strains.
30 April, 2023	Sunday

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Name of the Teacher – Dr. Twinkle Sugla
Class- M.Sc. Biotechnology Semester – II
Subject- Principles of Genetic Engineering
Paper- BT-107

May, 2023 1 st Week 1 May -6 May	<i>Saccharomyces cerevisiae</i> and <i>Pistia pastoris</i> expression systems Baculovirus Insect cell expression systems Mammalian cell expression system.
7 May, 2023	Sunday
2 nd Week 8 May -13 May	TEST + REVISION
14 May, 2023	Sunday
17 May, 2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject-Bioinformatics

Paper- 108

February,2023 1 st Week 1Feb-4 Feb	Bioinformatics and Biological Databases Bioinformatics: Introduction, Goal, Scope, Applications, Limitations, and New themes
5Feb, 2023	Guru RavidasJayanti, Sunday
2 nd Week 6Feb -11Feb	Biological Databases: Introduction, Types of Databases, Biological Databases, Pitfalls of Biological Databases, Information Retrieval from Biological Databases
12Feb, 2023	Sunday
3 rd Week 13Feb -17 Feb	Sequence Alignment Pairwise Sequence Alignment: Evolutionary Basis, Sequence Homology versus Sequence Similarity, Sequence Similarity versus Sequence Identity, Methods, Scoring Matrices, Statistical Significance of Sequence Alignment
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -25 Feb	Database Similarity Searching: Unique Requirements of Database Searching, Heuristic Database Searching, Basic Local Alignment Search Tool (BLAST),
26 Feb, 2023	Sunday
5 th Week 27 Feb -28 Feb	Comparison of FASTA and BLAST, Database Searching with the Smith–Waterman Method

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject-Bioinformatics

Paper- 108

March, 2023 1 st Week 1March -4 March	Multiple Sequence Alignment: Scoring Function, Exhaustive Algorithms, Heuristic Algorithms, Practical Issues
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	Profiles and Hidden Markov Models: Position-Specific Scoring Matrices, Profiles, Markov Model and Hidden Markov Model
19 March,2023	Sunday
4 th Week 20March-25 March	Protein Motifs and Domain Prediction: Identification of Motifs and Domains in Multiple Sequence Alignment, Motif and Domain Databases Using Regular Expressions, Motif and Domain Databases Using Statistical Models, Protein Family Databases, Motif Discovery in Unaligned Sequences, Sequence Logos.
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 31 March	Gene and Promoter Prediction Gene Prediction: Categories of Gene Prediction Programs, Gene Prediction in Prokaryotes, Gene Prediction in Eukaryotes.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject-Bioinformatics

Paper- 108

April, 2023 1 st Week 1 April, 2023	Promoter and Regulatory Element Prediction: Promoter and Regulatory Elements in Prokaryotes, Promoter and Regulatory Elements in Eukaryotes, Prediction Algorithms
2 April, 2023	Sunday
2 nd Week 3 April -8 April	Molecular Phylogenetics Phylogenetics Basics: Molecular Evolution and Molecular Phylogenetics, Terminology, Gene Phylogeny versus Species Phylogeny, Forms of Tree Representation, Why Finding a True Tree Is Difficult,
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April -15April	Phylogenetic Tree Construction Methods and Programs: Distance-Based Methods, Character-Based Methods, Phylogenetic Tree Evaluation, Phylogenetic programme. Genomics and Proteomics Genome Mapping, Assembly, and Comparison: Genome Mapping, Genome Sequence Assembly, Genome Annotation, Comparative Genomics Functional Genomics: Sequence-Based Approaches, Microarray-Based Approaches, Comparison of SAGE and DNA Microarrays Proteomics: Technology of Protein Expression Analysis, Posttranslational Modification, Protein Sorting, Protein-Protein Interactions
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -29 April	Structural Bioinformatics Protein Structure Basics: Amino Acids, Peptide Formation, Dihedral Angles, Hierarchy, Secondary Structures, Tertiary Structures, Determination of Protein Three-Dimensional Structure, Protein Structure Database
30 April, 2023	Sunday

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject-Bioinformatics

Paper- 108

May, 2023 1 st Week 1 May -6 May	Protein Structure Visualization, Comparison, and Classification: Protein Structural Visualization, Protein Structure Comparison, Protein Structure Classification Protein Tertiary Structure Prediction: Methods, Homology Modeling, Threading and Fold Recognition, Ab Initio Protein Structural Prediction, CASP RNA Structure Prediction: Introduction, Types of RNA Structures, RNA Secondary Structure Prediction Methods, Ab Initio Approach, Comparative Approach, Performance Evaluation
7 May, 2023	Sunday
2 nd Week 8 May -13 May	Protein Secondary Structure Prediction: Secondary Structure Prediction for Globular Proteins, Secondary Structure Prediction for Transmembrane Proteins, Coiled Coil Prediction
14 May, 2023	Sunday
17 May, 2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject- ATC

Paper- 109-A

February,2023 1 st Week 1Feb-4 Feb	Animal cell and tissues culture: Historical background, development, advantages and limitations of cell & tissue culture
5Feb, 2023 2 nd Week 6Feb -11Feb	Guru RavidasJayanti, Sunday Requirements of cell & tissue culture: aseptic area, incubation, preparation and sterilization, storage, specialized equipment, consumable items
12Feb, 2023 3 rd Week 13Feb -17 Feb	Sunday Aseptic techniques: elements of aseptic environment, sterile handling, laminar flow, standard procedure
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -25 Feb	Culture vessels and substrates: the substrate, choice of culture vessel, treated surfaces
26 Feb, 2023 5 th Week 27 Feb -28 Feb	Sunday Culture vessels and substrates: the substrate, choice of culture vessel, treated surfaces

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject- ATC

Paper- 109-A

March, 2023 1 st Week 1March -4 March	Defined media and supplements: physicochemical properties, balanced salt solutions, complete media, role of serum and supplements
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	serum free media: advantages and disadvantages of serum and serum free media, replacement of serum, development of serum free media.
19 March,2023	Sunday
4 th Week 20March-25 March	Primary culture: types of primary cell culture, isolation of the tissue, primary culture.
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 31 March	Sub-culturing of animal cells: Subculture and propagation, Criteria for subculture, Subculture of monolayer cells, growth cycle and split ratio, propagation and subculture in suspension

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject- ATC

Paper- 109-A

April, 2023 1 st Week 1 April, 2023	Cloning and selection: dilution and suspension cloning, scaling up in suspension and monolayer .
2 April, 2023	Sunday
2 nd Week 3 April -8 April	Cell line characterization: need for characterization, authentication, cell morphology, chromosome content, DNA content, RNA and protein expression,
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April - 15April	large scale production of cells using bioreactors, microcarriers and perfusion techniques
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -29 April	enzyme activity, antigen markers.
30 April, 2023	Sunday

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – SONIKA

Class- M.sc I Semester II

Subject- ATC

Paper- 109-A

May, 2023 1 st Week 1 May -6 May	growth cycle and split ratio,
7 May, 2023	Sunday
2 nd Week 8 May -13 May	large scale production of cells using bioreactors
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- M.sc I Semester II

Subject- PTC

Paper- 109-B

2nd Week 9Feb -11Feb	Introduction to plant cell and tissue culture and historical perspective. Laboratory organization, aseptic manipulations and culture media – composition, preparation and development.
12Feb, 2023	Sunday
3rd Week 16Feb -18 Feb	Callus culture; Initiation and maintenance of suspension culture- batch and continuous culture, assessment of growth and viability;
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4th Week 23Feb -25 Feb	Static techniques of single cell culture. Organogenesis, somatic embryogenesis and synthetic seeds.
26 Feb, 2023	Sunday

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- M.sc I Semester II

Subject- PTC

Paper- 109-B

1 st Week 2 March -4 March	Micropropagation – technique, factors affecting <i>in vitro</i> culture of plants (physical, chemical, genotypic and others), applications and limitations of micropropagation.
2nd Week 5 March -12 March, 2023	Holi Break
3rd Week 16 March-18 March	Meristem, shoot tip culture and production of virus free plants. Somaclonal variations, molecular basis of variation and their significance in plant breeding.
19 March,2023	Sunday
4 th Week 23 March-25 March	<i>In vitro</i> production of haploid plants – Androgenesis (anther and pollen culture) and Gynogenesis (ovary and ovule culture)..
23 March, 2023	Shaheedi Diwas / Martyrdom Day of Bhagat Singh, Rajguru & Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 30 March-1 April	Significance and uses of haploids in agriculture. Wide hybridization and embryo rescue technique. Subculture of monolayer cells, growth cycle and split ratio, propagation and subculture in suspension

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- M.sc I Semester II

Subject- PTC

Paper- 109-B

4 April, 2023	MahavirJayanti
April, 2023 2 nd Week 6 April-8 April , 2023	Isolation, culture and fusion of protoplast, selection of fusion products.
9 April, 2023	Sunday
3 rd Week 13April -15 April	plant regeneration, assessment of somatic hybrid plants,
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-UI-Fitr/ParshuramJayanti Sunday
5 th Week 24April -29 April	production of cybrids, applications of protoplast culture and somatic hybridization in the improvement of crop plants
30 April, 2023	Sunday

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- M.sc I Semester II

Subject- PTC

Paper- 109-B

May, 2023 1 st Week 4 May -6 May	<i>In vitro</i> germplasm conservation and cryopreservation.
7 May, 2023	Sunday
2 nd Week 11 May -13 May	To finish any remaining topic, revision
14 May, 2023	Sunday
17 May, 2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. Biotechnology Semester – II
Subject- Enzyme Technology
Paper- BT-110

February,2023 1 st Week 1Feb-4 Feb	History of enzymology, advantages of enzymes over chemical catalysts, Nomenclature and classification of enzymes;
5Feb, 2023	Guru Ravidas Jayanti, Sunday
2 nd Week 6Feb -11Feb	Determination of three dimensional structure of enzyme by 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;
12Feb, 2023	Sunday
3 rd Week 13Feb -17 Feb	Forces for stability of 3-D structure; Denaturation and renaturation;Isoenzymes, enzyme specificity, monomeric and oligomeric enzymes, multienzyme complex,
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -25 Feb	holoenzyme, apo-enzyme, cofactor, coenzyme, prosthetic group; enzyme activity unit, turn over number and specific activity, Ribozymes and Abzymes – A brief account.
26 Feb, 2023	Sunday
5 th Week 27 Feb -28 Feb	Enzyme action; effect of enzyme on the rate and equilibrium of a reaction;

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. Biotechnology Semester – II
Subject- Enzyme Technology
Paper- BT-110

March, 2023 1 st Week 1March -4 March	Principles that explain catalytic power and substrate specificity of enzymes; enzyme substrate complex, factors responsible for catalytic efficiency of enzyme; proximity and orientation effect, acid-base catalysis, covalent catalysis, strain and distortion theory;
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	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.
19 March,2023	Sunday
4 th Week 20March-25 March	An introduction to enzyme kinetics and its importance, Methods used for investigating the kinetics of enzyme catalyzed reactions; factors affecting the velocity of enzyme catalysed reaction; Michaelis-Menten equation, Vmax, Km and its significance; Lineweaver Burk plot- its advantages and limitations, Eadie- Hofstee and Hanes plots;
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. Biotechnology Semester – II
Subject- Enzyme Technology
Paper- BT-110

April, 2023 1 st Week 1 April, 2023	Strategies used for enzyme production, isolation and purification,
2 April, 2023	Sunday
2 nd Week 3 April -8 April	method of calculating the purification fold; estimation of enzyme activity; characterization of an enzyme, criteria of enzyme purity,
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April - 15April	determination of the molecular weight (Mr) and the number of sub-units of an enzyme; enzyme immobilization and its importance;
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -29 April	protein engineering; enzyme therapy, enzyme inhibitors and drug design; enzymes as biosensors, enzyme reactors;
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. Biotechnology Semester – II
Subject- Enzyme Technology
Paper- BT-110

May, 2023 1 st Week 1 May -6 May	Applications of enzymes in medicine, textile, leather, detergent, paper, bakery, dairy industry, beverage and fruit processing, food processing and preservation, clinical applications of enzyme estimation.
7 May, 2023	Sunday
2 nd Week 8 May -13 May	TEST + REVISION
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur

Class- Semester – IV

Subject- Environmental Biotechnology

Paper- BT-120

February,2023 1 st Week 1Feb-4 Feb	Environmental Biotechnology : An overview, concept, scope and market Biological control of air pollution. Bacterial examination of water for potability.
5Feb, 2023 2 nd Week 6Feb -11Feb	Guru RavidasJayanti, Sunday Testing of water for physiochemical parameters including BOD & COD. Solid waste : Sources and management (composting, wormicomposting and methane production).
12Feb, 2023 3 rd Week 13Feb -17 Feb	Sunday Waste water : origin, composition and treatment. Physical, chemical and biological treatment of waste water. Aerobic processes : activated sludge, oxidation ponds, trickling filter towers, and rotating discs.
18 Feb, 2023 19 Feb,2023 4 th Week 20Feb -25 Feb	MahaShivaratri Sunday Anaerobic processes: anaerobic digesters, anaerobic filters and upflow sludge blanket reactors. Microbiology and biochemistry of aerobic and anaerobic waste water treatment processes.
26 Feb, 2023 5 th Week 27 Feb -28 Feb	Sunday Environmental Monitoring: Biosensors for enviroanalmenal applications, BOD sensor, ammonia sensor, Nitrite sensor and sulphite ion sensor.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur

Class- Semester – IV

Subject- Environmental Biotechnology

Paper- BT-120

March, 2023 1 st Week 1March -4 March	Treatment of industrial effluents: distillery effluent, paper and pulp mill effluent, tannary effluent, textile dye effluent, removal of heavy metals from waste waters.
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	Bioremediation : Bioremediation of fuel oils and lubricants in soil and water. Degradation of sulphur compounds present in coal and petroleum.
19 March,2023	Sunday
4 th Week 20March-25 March	Indicator organisms: Safety indicators and Quality indicators
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 31 March	Microbial Insecticides : Bacteria, fungi and viruses. Use of R-DNA technology to enhance the efficacy microbial insecticides.

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur

Class- Semester – IV

Subject- Environmental Biotechnology

Paper- BT-120

April, 2023 1 st Week 1 April, 2023	Biofertilizers
2 April, 2023	Sunday
2 nd Week 3 April -8 April	Microbes in oil recovery and bioleaching
4 April, 2023 9 April, 2023	Mahavir Jayanti Sunday
3 rd Week 10 April - 15 April	Biodeterioration of stored plant food materials, leather, wool, metals, textiles, stone & related building.
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. Ambedkar Jayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/Parshuram Jayanti Sunday
5 th Week 24 April -29 April	Microbial degradation of xenobiotics, genetic engineering of biodegradation pathways.
30 April, 2023	Sunday

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur

Class- Semester – IV

Subject- Environmental Biotechnology

Paper- BT-120

May, 2023 1st Week 1 May -6 May	Control of microbial bideterioration
7 May, 2023	Sunday
2nd Week 8 May -13 May	TESTS + REVISION
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Twinkle Sugla + Manpreet Kaur

Class- M.Sc. Biotechnology Semester - IV

Subject- Animal Biotechnology

Paper- BT-121

February,2023 1 st Week 1Feb-4 Feb	Animal Biotechnology- Scope, global perspective and new horizons, Historical perspective, and economically important livestock breeds,
5Feb, 2023	Guru RavidasJayanti, Sunday
2 nd Week 6Feb -11Feb	Model animals in animal biotechnology and genetic engineering
12Feb, 2023	Sunday
3 rd Week 13Feb -17 Feb	Somatic Cell Genetics: Production of hybrid cells, Properties of hybrids, Applications hybrid cells,
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -25 Feb	Gene Transfer into Animal Cells: DNA transfer techniques into mammalian cells: calcium phosphate precipitation, DEAE-dextran procedure, polycation DMSO, microinjection, electroporation;
26 Feb, 2023	Sunday
5 th Week 27 Feb -28 Feb	Selectable markers, viral vectors for gene transfer into mammalian cells: SV40, adenovirus, vaccinia, bovine papiloma virus, baculovirus, retrovirus

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Twinkle Sugla + Manpreet Kaur

Class- M.Sc. Biotechnology Semester - IV

Subject- Animal Biotechnology

Paper- BT-121

March, 2023 1 st Week 1March -4 March	Transgenic animals: Transgenic mice: Methodology and applications; Transgenic cattle
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-18 March	Biotechnology in livestock assisted reproduction, biodiversity and conservation: Biotechnology in conservation of livestock diversity,
19 March,2023	Sunday
4 th Week 20March-25 March	Superovulation, Embryo biotechnology- Embryo collection, evaluation, and transfer, IVF and <i>in vitro</i> embryo production
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 31 March	Cryobanking of germplasm, oocytes and sperm, Somatic cell nuclear transfer, Stem cells technology in livestock

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Twinkle Sugla + Manpreet Kaur

Class- M.Sc. Biotechnology Semester - IV

Subject- Animal Biotechnology

Paper- BT-121

April, 2023 1 st Week 1 April, 2023	TEST
2 April, 2023	Sunday
2 nd Week 3 April -8 April	Animal cloning: Concepts of animal cloning, Principles and techniques of cloning, Applications of animal cloning.
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April - 15April	Animal genomics: crucial role for health and biomedical sciences. Models used in animal genomics.
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -21 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-UI-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -29 April	Livestock transgenesis- production of drugs using animals
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Twinkle Sugla + Manpreet Kaur

Class- M.Sc. Biotechnology Semester - IV

Subject- Animal Biotechnology

Paper- BT-121

May, 2023 1 st Week 1 May -6 May	Functional genomics and livestock traits assessment, Livestock in the post genomic era of biology and medicine
7 May, 2023	Sunday
2 nd Week 8 May -13 May	TEST + REVISION
14 May, 2023	Sunday
17May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc Ist Biotechnology SEMESTER II

Subject- General Microbiology

Paper- III

February, 2023 1 st Week 1Feb	Introduction and Scope of Microbiology Definition and history of microbiology, contributions of Antony van Leeuwenhoek, Louis Pasteur, Robert Koch, Importance and scope of Microbiology as a modern Science Branches of microbiology
5Feb, 2023	Guru RavidasJayanti, Sunday
2 nd Week 6Feb -8Feb	Microscope Construction and working principles of different types of microscopes – compound, dark field, Phase contrast, Fluorescence and Electron (Scanning and transmission
12Feb, 2023	Sunday
3 rd Week 13Feb -15Feb	Microbial techniques Sterilization: Principles and Applications of a. Physical Methods. Autoclave, Hot air oven, Laminar airflow, Seitz filter, Sintered glass filter,
18 Feb, 2023 19 Feb, 2023	MahaShivaratri Sunday
4 th Week 20Feb -22 Feb	membrane filter. b. chemical Methods: Alcohol, Aldehydes, Phenols, Halogens and Gaseous agents.
26 Feb, 2023	Sunday
5 th Week 27 Feb -28 Feb	Radiation Methods: UV rays and Gamma stains. Stains and staining techniques: Principles of staining, types of stains – simple stains, structural stains and Differential stains

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Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc Ist Biotechnology SEMESTER II

Subject- General Microbiology

Paper- III

March, 2023 1 st Week 1March -2 March	Microbial Taxonomy Concept of microbial species and strains, classification of bacteria based on – morphology (shape and flagella)
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-15 March	Staining reaction, nutrition and extreme environment. General Account of Viruses and Bacteria
19 March,2023	Sunday
4 th Week 20March- 22March	Bacteria – Ultrastructure of bacteria cell (both Gram positive and Gram negative) including endospore and capsule
23 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March-29 March	Viruses – Structure and classification Plant viruses – CaMV Animal viruses – Hepatitis B Bacterial Virus – Lamba Phage Pathogenic Microorganisms

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc Ist Biotechnology SEMESTER II

Subject- General Microbiology

Paper- III

April, 2023 1 st Week 1 April, 2023	Bacterial diseases of man – tetanus, Tuberculosis, Pneumonia and Cholera
2 April, 2023	Sunday
2 nd Week 3 April -5 April	Bacterial diseases of man – tetanus, Tuberculosis, Pneumonia and Cholera
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April - 12April	Viral diseases: AIDS (HIV)
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -19 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-UI-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -26 April	Microbial Growth and Metabolism
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc Ist Biotechnology SEMESTER II

Subject- General Microbiology

Paper- III

May, 2023 1 st Week 1 May -3 May	Kinetics of microbial growth, growth curve, synchronous growth, factors affecting bacterial growth Respiration: EMP, HMP and ED Pathways,
7 May, 2023	Sunday
2 nd Week 8 May -10 May	Kreb's cycle, Oxidative Phosphorylation. Bacterial Photosynthesis: Photosynthetic apparatus in prokaryotes, Photophosphorylation & Dark reaction.
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc Ist Biotechnology SEMESTER II
Subject- Biochemistry II
Paper- IV

2nd Week 9Feb -11Feb	Enzymes: Introduction, active site, energy of activation, transition state hypothesis
12Feb, 2023	Sunday
3rd Week 16Feb -18Feb	lock and key hypothesis, induced fit hypothesis. Enzyme classification (Major classes only)
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4th Week 23Feb -25 Feb	Enzyme Kinetics –substrate concentration, Km, Vmax, MM equation,
26 Feb, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc Ist Biotechnology SEMESTER II
Subject- Biochemistry II
Paper- IV

1 st Week 2 March -4 March	Lineweaver Burk plot/Double reciprocal plot. Effect of pH, temperature on enzyme activity. Allosteric enzymes
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 16 March-18 March	Enzyme Inhibition – Competitive, non-competitive and uncompetitive inhibition.
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 16 March-18 March	Enzyme Inhibition – Competitive, non-competitive and uncompetitive inhibition.
19 March,2023	Sunday
4 th Week 23 March-25 March	Vitamins and Hormones: Introduction. Types of vitamins – structure of water soluble vitamins and their coenzyme derivatives, Fat soluble vitamins Deficiency symptoms and dietary sources.
23 March, 2023 26 March, 2023	ShaheediDiwas/Martyrdom Dayof Bhagat Singh, Rajguru&Sukhdev Sunday
30 March, 2023	Ram Navmi
5 th Week 31 March	Hormones: structure and importance, Peptide Hormones: structure and function of important peptide hormones.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- B.sc Ist Biotechnology SEMESTER II

Subject- Biochemistry II

Paper- IV

April, 2023 1 st Week 1 April, 2023	Metabolism: General introduction, catabolism and anabolism
2 April, 2023	Sunday
2 nd Week 6 April - 8 April	Glycolysis, Tricarboxylic acid cycle, Gluconeogenesis Glycogenolysis, glycogen synthesis and their regulation,
4 April, 2023 9 April, 2023	Mahavir Jayanti Sunday
3 rd Week 13 April -15 April	Lipid Metabolism: β -oxidation of fatty acids. Degradation of Triacylglycerols.
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. Ambedkar Jayanti Sunday
4 th Week 17 April -19 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/Parshuram Jayanti Sunday
4 th Week 20 April -21 April	Synthesis of Fatty acids
5 th Week 27 April -29 April	Amino acid Metabolism: Transamination
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc Ist Biotechnology SEMESTER II
Subject- Biochemistry II
Paper- IV

May, 2023 1 st Week 4 May - 6 May	Oxidative deamination, decarboxylation.
7 May, 2023	Sunday
2 nd Week 11 May -13 May	Urea cycle. Different classes of oxidation and synthesis of amino acids. Glycogenic and ketogenic amino acids.
14 May, 2023	Sunday
17 May, 2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc IInd Biotechnology SEMESTER IV
Subject- Recombinant DNA Technology
Paper- VIII

3rd Week 13Feb -15Feb	Recombinant DNA Technology and Genetic Engineering: Introduction, history, scope and applications..
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4th Week 20Feb -22 Feb	Tools of Recombinant DNA technology: Steps in gene cloning. Gene cloning tools – Restriction enzymes- class I, II and class III restriction enzymes, their features. Ligases,
26 Feb, 2023	Sunday
5th Week 27 Feb -1 March	polymerases, alkaline phosphatases, kinases, transferases and other DNA engineering enzymes. Gene Cloning Vectors: Introduction, nomenclature of vectors, properties of a suitable vector.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc IInd Biotechnology SEMESTER IV
Subject- Recombinant DNA Technology
Paper- VIII

March, 2023 1st Week 6 March -8 March	Plasmid vectors, bacteriophage, cosmids and phagemids. Properties of host. M13 vectors. Expression vectors, shuttle vectors.
2nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-15 March	Vectors for cloning in eukaryotic cells, YACs and BACs. Isolation of gene of interest and vector DNA cohesive and blunt ends, modification of cut ends, linkers and adaptors.
19 March, 2023	Sunday
23 March, 2023 25 March, 2023	Shaheedi Diwas/Martyrdom Day of Bhagat Singh, Rajguru & Sukhdev Sunday
30 March, 2023	Ram Navmi

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla
Class- B.sc IInd Biotechnology SEMESTER IV
Subject- Recombinant DNA Technology
Paper- VIII

2 April, 2023	Sunday
2 nd Week 3April -5April	Construction of Genomic and cDNA library, advantages and limitations, screening of gene libraries. Basic features and applications of PCR. PCR types and modifications.
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 10April -12 April	Site directed mutagenesis. Restriction enzyme digestion and restriction mapping Southern and Northern analysis DNA finger printing. PAGE, Western blotting, dot blots and slot blots.
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -19 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-UI-Fitr/ParshuramJayanti Sunday
5 th Week 24 April -26 April	RFLP, RAPD (brief only), microarrays. Gilbert's method, Sanger's dideoxy chain termination method, Automated DNA sequencing.
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Dr. Twinkle Sugla

Class- B.sc IInd Biotechnology SEMESTER IV

Subject- Recombinant DNA Technology

Paper- VIII

May, 2023 1st Week 1 May – 3 May	Promoters- tissue specific promoters, wound inducible promoters, strong and regulated promoters. Increasing protein yield-factors affecting level of recombinant protein production. Production of recombinant proteins in E. coli, translational and transcriptional fusion- advantages and disadvantages.
7 May, 2023	Sunday
2nd Week 8 May -10 May	Production of recombinant proteins of pharmaceutical importance- insulin, human growth hormone, recombinant vaccines (hepatitis B) etc. Transgenic plants and animals.
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc IInd Biotechnology SEMESTER IV

Subject- BIOINFORMATICS

Paper- IX

February,2023 2 st Week 4Feb	History, scope and importance of bioinformatics.
5Feb, 2023 2 nd Week 9Feb -11Feb	Guru RavidasJayanti, Sunday Introduction to Genomics – information flow in Biology, DNA sequence database.
12Feb, 2023 3 rd Week 15Feb -17Feb	Sunday experimental approach to genome sequence data, genome information resources.
18 Feb, 2023 19 Feb,2023 4 th Week 22Feb -24 Feb	MahaShivaratri Sunday Functional Proteomics – protein sequence and structural data, protein information resources and secondary data bases
26 Feb, 2023 5 th Week 27 Feb -28 Feb	Sunday Computational Genomics - Internet basics, biological data analysis and application, sequence data bases, NCBI model, File format.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc IInd Biotechnology SEMESTER IV

Subject- BIOINFORMATICS

Paper- IX

March, 2023 1 st Week 2March -4 March	Sequence alignment and data base search – protein primary sequence analysis, algorithm BLAST, multiple sequence alignment.
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 9 March-11 March	DATA base searching using BLAST and FASTA
19 March,2023	Sunday
23 March, 2023 25 March, 2023	ShaheediDiwas/Martyrdom Day of Bhagat Singh, Rajguru&Sukhdev Sunday
30 March, 2023	Ram Navmi
5 th Week 30March-31 March	NCBI model, File format

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc IInd Biotechnology SEMESTER IV

Subject- BIOINFORMATICS

Paper- IX

April, 2023 1 st Week 1 April, 2023	Predictive methods using DNA and protein sequences
2 April, 2023	Sunday
2 nd Week 7 April -8 April	Predictive methods using DNA and protein sequences
4 April, 2023 9 April, 2023	MahavirJayanti Sunday
3 rd Week 13April - 15April	Synthesis of Fatty acids. Amino acid Metabolism: Transamination
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. AmbedkarJayanti Sunday
4 th Week 17 April -19 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/ParshuramJayanti Sunday
5 th Week 27 April -29 April	Oxidative deamination, decarboxylation. Urea cycle.
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Sonika

Class- B.sc IInd Biotechnology SEMESTER IV

Subject- BIOINFORMATICS

Paper- IX

May, 2023 1 st Week 4 May -6 May	Glycogenic and ketogenic amino acids
7 May, 2023	Sunday
2 nd Week 11 May -13 May	Secondary database and Ravision
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. Biotechnology SEMESTER VI
Subject- Microbial Biotechnology
Paper- XIII

February,2023 1 st Week 1Feb-	Microbial Biotechnology: Historical landmarks, General concept.
5Feb, 2023 2 nd Week 6Feb -8Feb	Guru RavidasJayanti, Sunday Screening and Isolation of Micro organisms: Industrially important microbes, their screening and isolation, enrichment culture. Strain improvement-bacterial genetics, mutant selection, recombination,
12Feb, 2023 3 rd Week 13Feb -15 Feb	Sunday Recombinant DNA technology, Strain preservation and maintenance.
18 Feb, 2023 19 Feb,2023	MahaShivaratri Sunday
4 th Week 20Feb -22 Feb	Nutrition and cultivation of microorganisms: Basic nutrition and metabolism, Natural and Synthetic media, Sterilization techniques,
26 Feb, 2023 5 th Week 27 Feb -28 Feb	Sunday Microbial growth kinetics. Fermentation types – Continuous, Batch fed culture, Solid state and Submerged.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. Biotechnology SEMESTER VI
Subject- Microbial Biotechnology
Paper- XIII

March, 2023 1 st Week 1 March	Quantification of growth, thermodynamics of growth, effect of different factors on growth. Fermentation concepts and types.
2 nd Week 5 March -12 March, 2023	Holi Break
3 rd Week 13 March-15 March	Microbial Fermenters/Bioreactors: Basic design of fermenters. Physico-chemical standards used in bioreactors (agitation, aeration, ph, temp., dissolved oxygen etc.). Types of fermenters stirred tank, bubble column, airlift etc
19 March,2023	Sunday
4 th Week 20 March-22 March	Genetically engineered microbes: concept and technique; use of GEM in Agriculture, Industry and Medicine
23 March, 2023	Shaheedi Diwas/Martyrdom Day of Bhagat Singh, Rajguru & Sukhdev
26 March, 2023	Sunday
30 March, 2023	Ram Navmi
5 th Week 27 March- 29 March	Process Development and Downstream Processing: Shake flask fermentation, scale up of the process. Downstream processing – Separation of particles, disintegration of cells, extraction, concentration, purification and drying of the products.

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. Biotechnology SEMESTER VI
Subject- Microbial Biotechnology
Paper- XIII

April, 2023 1 st Week 1 April, 2023	Microbial Products: a brief discussion about production of certain industrial products such as – Alcohol, Alcoholic beverage (Beer),
2 April, 2023	Sunday
2 nd Week 3 April -5 April	Organic acids (citric acid), Antibiotics (penicillin), Amino acids (glutamic acid, Vitamin (B12), enzymes (protease, alpha-amylase)
4 April, 2023 9 April, 2023	Mahavir Jayanti Sunday
3 rd Week 10 April - 12 April	- brief account of Steroid Biotransformation. Microbial Foods: Single Cell Proteins. Sewage waste water treatment technique and plants. Biodegradation of xenobiotic compounds.
14 April, 2023 16 April, 2023	Vaisakhi/Dr. B.R. Ambedkar Jayanti Sunday
4 th Week 17 April -19 April	Sessional Exams
22 April, 2023 23 April, 2023	Id-Ul-Fitr/Parshuram Jayanti Sunday
5 th Week 24 April -26 April	Microbial polysaccharides and polyesters; production of xanthan gum and polyhydroxyalkanoates (PHA).
30 April, 2023	Sunday

KVA DAV College for Women, Karnal

Lesson Plan For The Even Semester (February to May, 2023)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. Biotechnology SEMESTER VI
Subject- Microbial Biotechnology
Paper- XIII

May, 2023 1 st Week 1 May -3 May	Bioconversions – Biomining and bioleaching. Biogas production
7 May, 2023	Sunday
2 nd Week 8 May -10 May	Microbial technology in agriculture- Bioinsecticides, bioherbicides, biocontrol agents for disease control, advantages over chemical methods. Biofertilizers.
14 May, 2023	Sunday
17 May,2023 Onwards	University Examinations