

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- MICROBIOLOGY

Paper- PAPER III

Class- B.sc IInd Semester BIOTECHNOLOGY

April, 2022 2 nd Week 4,5,6 April	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.
10 April, 2022	Sunday
3 rd Week 11 ,12,13 April	Microscope Construction and working principles of different types of microscopes – compound, dark field, Phase contrast, Fluorescence and Electron (Scanning and transmission)
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18,19,20 April	Microbial techniques Sterilization: Principles and Applications of a. Physical Methods. Autoclave, Hot air oven, Laminar airflow, Seitz filter, Sintered glass filter, and membrane filter.
24April, 2022	Sunday
5 th Week 25,26,27 April	Chemical Methods: Alcohol, Aldehydes, Phenols, Halogens and Gaseous agents. c. Radiation Methods: UV rays and Gamma stains. Stains and staining techniques: Principles of staining, types of stains – simple stains, structural stains and Differential stains.
1 May, 2022	Sunday
May 2022 1 st Week 2,3,4 May	Microbial Taxonomy Concept of microbial species and strains, classification of bacteria based on – morphology (shape and flagella), staining reaction, nutrition and extreme environment. General Account of Viruses and Bacteria.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9,10,11 May	Bacteria – Ultrastructure of bacteria cell (both Gram positive and Gram negative) including endospore and capsule.
15 May, 2022	Sunday
3 rd Week 16,17,18 May	Viruses – Structure and classification Plant viruses – CaMV Animal viruses – Hepatitis B Bacterial Virus – Lamba Phage Pathogenic Microorganisms.

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- MICROBIOLOGY

Paper- PAPER III

Class- B.sc IInd Semester BIOTECHNOLOGY

22 May, 2022	Sunday
May, 2022 4 th Week 23,24,25 MAY	Sessionals
29 May, 2022	Sunday
5 th Week 30 ,31 May	Bacterial diseases of man – tetanus, Tuberculosis, Pneumonia and Cholera.
June 2022 1 st week 1 JUNE	Viral diseases: AIDS (HIV) Microbial Growth and Metabolism.
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6,7,8 June	Kinetics of microbial growth, growth curve, synchronous growth, factors affecting bacterial growth Respiration: EMP, HMP and ED Pathways, Kreb's cycle, Oxidative Phosphorylation. Bacterial Photosynthesis: Photosynthetic apparatus in prokaryotes, Photophosphorylation & Dark reaction.

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biochemistry II

Paper- IV

Class- B.Sc. (II)

April, 2022 2 nd Week 6 April -9 April	<ul style="list-style-type: none">Enzymes
10 April, 2022	Sunday
3 rd Week 13 April-16 April	<ul style="list-style-type: none">Enzyme KineticsTESTTOPIC DISCUSSION
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 20 April-23 April	<ul style="list-style-type: none">VitaminsTESTTOPIC DISCUSSION
24 April, 2022	Sunday
5 th Week 27 April - 30 April	<ul style="list-style-type: none">HormonesTESTTOPIC DISCUSSION
1 May, 2022	Sunday
May 2022 1 st Week 4 May -7 May	<ul style="list-style-type: none">HormonesTESTTOPIC DISCUSSION
3 May , 2022 8 May , 2022	Eid-ul-Fitr Sunday
2 nd Week 11 May -14 May	<ul style="list-style-type: none">MetabolismCarbohydrates metabolismTESTTOPIC DISCUSSION
15 May, 2022	Sunday
3 rd Week 18 May-21 May	<ul style="list-style-type: none">Carbohydrates metabolismLipid MetabolismTESTTOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Biochemistry II

Paper- IV

Class- B.Sc. (II)

22 May, 2022	Sunday
May, 2022 4 th Week 25 May--28 May	Sessionals
29 May, 2022	Sunday
June 2022 1 st week 2 June - 4 June	<ul style="list-style-type: none">• Lipid Metabolism• Amino acid Metabolism• TEST• TOPIC DISCUSSION
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 8 June –11 June	<ul style="list-style-type: none">• Amino acid Metabolism• TEST• TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Recombinant DNA Technology

Paper- VIII

Class- B.Sc. (IV Sem.)

April, 2022 2 nd Week 4April -6 April	<ul style="list-style-type: none">• Recombinant DNA Technology and Genetic Engineering: Introduction, history, scope and applications.• 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, polymerases,• Alkaline phosphatases, kinases, transferases and other DNA engineering enzymes
10 April, 2022	Sunday
3 rd Week 11 April-13 April	<ul style="list-style-type: none">• Gene Cloning Vectors• TEST• TOPIC DISCUSSION
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-20 April	<ul style="list-style-type: none">• In vitro construction of r-DNA molecules• Transformation• TEST• TOPIC DISCUSSION
24April, 2022	Sunday
5 th Week 25 April - 27April	<ul style="list-style-type: none">• Selection of clone having the specific DNA insert• Marker genes- selectable and scorable markers• TEST• TOPIC DISCUSSION
1 May, 2022	Sunday
May 2022 1 st Week 2May -4 May	<ul style="list-style-type: none">• Gene Libraries• DNA amplification through PCR• TEST• TOPIC DISCUSSION
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Recombinant DNA Technology

Paper- VIII

Class- B.Sc. (IV Sem.)

2 nd Week 9 May -11 May	<ul style="list-style-type: none">• DNA sequencing techniques• Genome Mapping• TEST• TOPIC DISCUSSION
15 May, 2022	Sunday
3 rd Week 16 May-18 May	<ul style="list-style-type: none">• Genome Mapping• Gene expression in prokaryotes• TEST• TOPIC DISCUSSION
22 May, 2022	Sunday
May, 2022 4 th Week 23 May--25 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	<ul style="list-style-type: none">• Gene expression in prokaryotes• Applications of Recombinant DNA technology TEST• TOPIC DISCUSSION
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –08 June	<ul style="list-style-type: none">• Applications of Recombinant DNA technology• TEST• TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- BIOINFORMATICS

Paper- PAPER IX BIOINFORMATICS

Class- B.sc VI Semester BIOTECHNOLOGY

April, 2022 2 nd Week 7,8,9 April	History, scope and importance of bioinformatics.
10 April, 2022	Sunday
3 rd Week 15,16 April	Introduction to Genomics – information flow in Biology, DNA sequence data, experimental approach to genome sequence data, genome information resources.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 21,22,23 April	Functional Proteomics .
24April, 2022	Sunday
5 th Week 28,29,30 April	Protein sequence and structural data, protein information resources and secondary data bases.
1 May, 2022	Sunday
May 2022 1 st Week 5,6,7, May	Computational Genomics.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 12,13,14 May	Internet basics, biological data analysis and application, sequence data bases, NCBI model, File format.
15 May, 2022	Sunday
3 rd Week 19,20,21 May	Sequence alignment and data base search.

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- BIOINFORMATIC

Paper- PAPER IX BIOINFORMATICS

Class- B.Sc. VI Semester BIOTECHNOLOGY

22 May, 2022	Sunday
May, 2022 4 th Week 26,27, -28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Protein primary sequence analysis, algorithm BLAST, multiple sequence alignment. DATA base searching.
June 2022 1 st week 2,3,4 June	BLAST, FASTA
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 9,10,11 June	Predictive methods using DNA and protein sequences Structural data bases – Small molecules data bases, protein information resources, protein data bank.

KVA DAV College for Women, Karnal

**Lesson plan for the Even semester
(April, 2022 to June, 2022)**

Name of the Teacher – Manpreet Kaur

Subject- Microbial Biotechnology

Paper- PAPER XIII

Class- B.Sc. VI Semester BIOTECHNOLOGY

April, 2022 2nd Week 7,8,9 April	Microbial Biotechnology: Historical landmarks, General concept. Screening and Isolation of Micro organisms: Industrially important microbes, their screening and isolation, enrichment culture, Strain improvement- bacterial genetics, mutant selection, recombination, recombinant DNA technology.
10 April, 2022	Sunday
3rd Week 15,16 April	Strain preservation and maintenance, Nutrition and cultivation of microorganisms: Basic nutrition and metabolism, Natural and Synthetic media, Sterilization techniques, Microbial growth kinetics. Fermentation types – Continuous, Batch fed culture, Solid state and Submerged.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4th Week 21,22,23 April	Quantification of growth, thermodynamics of growth, effect of different factors on growth. Fermentation concepts and types.
24 April, 2022	Sunday
5th Week 28,29,30 April	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.
1 May, 2022	Sunday
May 2022 1st Week 5,6,7, May	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.
3 May , 2022 8 May , 2022	Eid-ul-Fitr Sunday
2nd Week 12,13,14 May	Microbial Products: a brief discussion about production of certain industrial products such as – Alcohol, Alcoholic beverage (Beer), Organic acids (citric acid), Antibiotics (penicillin), Amino acids (glutamic acid, Vitamin (B12)
15 May, 2022	Sunday
3rd Week 19,20,21 May	Enzymes (protease, alpha-amylase) and a brief account of Steroid Biotransformation. Microbial Foods: Single Cell Proteins. Sewage waste water treatment technique and plants. Biodegradation of xenobiotic compounds.

KVA DAV College for Women, Karnal

**Lesson plan for the Even semester
(April, 2022 to June, 2022)**

Name of the Teacher – Manpreet Kaur

Subject- Microbial Biotechnology

Paper- PAPER XIII

Class- B.sc VI Semester BIOTECHNOLOGY

22 May, 2022	Sunday
May, 2022 4th Week 26,27, -28 May	Sessionals
29 May, 2022	Sunday
5th Week 30 May -31 May	Microbial polysaccharides and polyesters; production of xanthan gum and polyhydroxyalkanoides (PHA). Bioconversions – Biomining and bioleaching. Biogas production.
June 2022 1st week 2,3,4 June	Microbial technology in agriculture- Bioinsecticides, bioherbicides, biocontrol agents for disease control, advantages over chemical methods. Biofertilizers.
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2nd Week 9,10,11 June	Genetically engineered microbes: concept and technique; use of GEM in Agriculture, Industry and Medicine.

KVA DAV College for Women, Karnal

Lesson plan for the even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Principles of Genetics Engineering

Paper- BT-107

Class- M.Sc. (II Semester)

April, 2022 2 nd Week 4 April -9 April	<ul style="list-style-type: none">• Genetic Engineering• Nucleic Acids• Manipulation of purified DNA
10 April, 2022	Sunday
3 rd Week 11 April-16 April	<ul style="list-style-type: none">• Gene Cloning Vectors• TEST• TOPIC DISCUSSION
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	<ul style="list-style-type: none">• Transformation of <i>E. coli</i>• Cloning of Specific Gene• Methods for Clone Identification• TEST• TOPIC DISCUSSION
24 April, 2022	Sunday
5 th Week 25 April - 30 April	<ul style="list-style-type: none">• Protein-Protein interactions• Nucleic Acid Sequencing• TEST• TOPIC DISCUSSION
1 May, 2022	Sunday
May 2022 1 st Week 2 May -7 May	<ul style="list-style-type: none">• Nucleic Acid Sequencing• Polymerase Chain Reaction• TEST• TOPIC DISCUSSION
3 May , 2022 8 May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	<ul style="list-style-type: none">• Site Directed Mutagenesis• TEST• TOPIC DISCUSSION

15 May, 2022	Sunday
3rd Week 16 May-21 May	<ul style="list-style-type: none"> • Gene expression and Regulation studies • TEST • TOPIC DISCUSSION
22 May, 2022	Sunday
May, 2022 4th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5th Week 30 May -31 May	<ul style="list-style-type: none"> • Manipulation of gene expression in prokaryotes • TEST • TOPIC DISCUSSION
June 2022 1st week 1 June - 4 June	<ul style="list-style-type: none"> • Manipulation of gene expression in prokaryotes • Heterologus protein production in Eukaryotes • TEST • TOPIC DISCUSSION
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2nd Week 6 June –11 June	<ul style="list-style-type: none"> • Heterologus protein production in Eukaryotes • TEST • TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- BIOINFORMATICS

Paper- PAPER IX BIOINFORMATICS

Class- B.sc VI Semester BIOTECHNOLOGY

April, 2022 2 nd Week 7,8,9 April	History, scope and importance of bioinformatics.
10 April, 2022	Sunday
3 rd Week 15,16 April	Introduction to Genomics – information flow in Biology, DNA sequence data, experimental approach to genome sequence data, genome information resources.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 21,22,23 April	Functional Proteomics .
24April, 2022	Sunday
5 th Week 28,29,30 April	Protein sequence and structural data, protein information resources and secondary data bases.
1 May, 2022	Sunday
May 2022 1 st Week 5,6,7, May	Computational Genomics.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 12,13,14 May	Internet basics, biological data analysis and application, sequence data bases, NCBI model, File format.
15 May, 2022	Sunday
3 rd Week 19,20,21 May	Sequence alignment and data base search.

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- BIOINFORMATIC

Paper- PAPER IX BIOINFORMATICS

Class- B.sc VI Semester BIOTECHNOLOGY

22 May, 2022	Sunday
May, 2022 4 th Week 26,27, -28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Protein primary sequence analysis, algorithm BLAST, multiple sequence alignment. DATA base searching.
June 2022 1 st week 2,3,4 June	BLAST, FASTA
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 9,10,11 June	Predictive methods using DNA and protein sequences Structural data bases – Small molecules data bases, protein information resources, protein data bank.

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- ATC

Paper- PAPER 109A

Class- M.sc IInd Semester BIOTECHNOLOGY

April, 2022 2 nd Week 4April -9 April	Animal cell and tissues culture: Historical background, development, advantages and limitations of cell & tissue culture
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Requirements of cell & tissue culture: aseptic area, incubation, preparation and sterilization, storage, specialized equipment, consumable items
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Aseptic techniques: elements of aseptic environment, sterile handling, laminar flow, standard procedure. Culture vessels and substrates: the substrate, choice of culture vessel, treated surfaces.
24April, 2022	Sunday
5 th Week 25 April - 30April	Defined media and supplements: physicochemical properties, balanced salt solutions, complete media, Applications of animal cell culture: virology, cancer research, gene therapy, drug development and cytotoxicity, animal cloning, genetic counseling, cryopreservation of Cell.
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Role of serum and supplements, serum free media: advantages and disadvantages of serum and serum free media, replacement of serum, development of serum free media.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Primary culture: types of primary cell culture, isolation of the tissue, primary cultur
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Sub-culturing of animal cells: Subculture and propagation, Criteria for subculture, Subculture of monolayer cells

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – SONIKA

Subject- ATC

Paper- 109 A

Class- M.sc IInd Semester BIOTECHNOLOGY

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	growth cycle and split ratio, propagation and subculture in suspension.
June 2022 1 st week 1 June - 4 June	Cloning and selection: dilution and suspension cloning, scaling up in suspension and monolayer, large scale production of cells using bioreactors, microcarriers and perfusion techniques.
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Cell line characterization: need for characterization, authentication, cell morphology, chromosome content, DNA content, RNA and protein expression, enzyme activity, antigen markers. Unit-IV Production of high value therapeutics: enzymes, hormones, monoclonal antibody, cytokines, tissue plasminogen activators.

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Plant Tissue and Cell Culture

Paper- BT-109 (B)

Class- M.Sc. (II)

April, 2022 2 nd Week 6,8,9 April	<ul style="list-style-type: none">• Introduction to plant cell and tissue culture and historical perspective• Laboratory organization• Aseptic manipulations and culture media – composition preparation and development.• Callus culture; Initiation and maintenance of suspension culture- batch and continuous Culture• Assessment of growth and viability
10 April, 2022	Sunday
3 rd Week 13,15,16 April	<ul style="list-style-type: none">• Assessment of growth and viability• Static techniques of single cell culture.• Organogenesis• TEST• TOPIC DISCUSSION
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 20,22,23 April	<ul style="list-style-type: none">• Somatic embryogenesis• Synthetic seeds• Micropropagation• TEST• TOPIC DISCUSSION
24 April, 2022	Sunday
5 th Week 27,29,30 April	<ul style="list-style-type: none">• Micropropagation• Applications and limitations of Micropropagation• TEST• TOPIC DISCUSSION
1 May, 2022	Sunday

May 2022 1st Week 4,6,7 May	<ul style="list-style-type: none"> • <i>In vitro</i> production of haploid plants • TEST • TOPIC DISCUSSION
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2ndWeek 11,13,14 May	<ul style="list-style-type: none"> • Significance and uses of haploids in agriculture • Wide hybridization and embryo rescue technique • TEST • TOPIC DISCUSSION
15 May, 2022	Sunday
3rdWeek 18,20,21 May	<ul style="list-style-type: none"> • Protoplast culture and somatic hybridization • TEST • TOPIC DISCUSSION

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Kajal Sahni

Subject- Plant Tissue and Cell Culture

Paper- BT-109 (B)

Class- M.Sc. (II)

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
June 2022 1 st week 1,3,4 June	<ul style="list-style-type: none">• Protoplast culture and somatic hybridization• <i>In vitro</i> germplasm conservation and cryopreservation• TEST• TOPIC DISCUSSION
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 8,10,11 June	<ul style="list-style-type: none">• Syllabus Discussion• TEST• TOPIC DISCUSSION

Lesson plan for the Even semester
(April, 2022 to June, 2022)

Name of the Teacher – Manpreet Kaur

Subject- Enzyme Technology

Paper- Paper BT-110

Class- M.Sc. Biotechnology Semester - II

April, 2022 2 nd Week 4April -9 April	History of enzymology, advantages of enzymes over chemical catalysts, Nomenclature and classification of enzymes; Determination of three dimensional structure of enzyme by X-ray crystallography and NMR spectrometry, importance of 3-D structure of an enzyme;
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Classification of enzyme structures, structures adopted by enzymes, principles that govern the 3-D structure adopted by enzymes; Forces for stability of 3-D structure; Denaturation and renaturation
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Isoenzymes, enzyme specificity, monomeric and oligomeric enzymes, multienzyme complex, holoenzyme, apo-enzyme, cofactor, coenzyme, prosthetic group; enzyme activity unit, turn over number and specific activity, Ribozymes and Abzymes – A brief account.
24April, 2022	Sunday
5 th Week 25 April - 30April	Enzyme action; effect of enzyme on the rate and equilibrium of a reaction; principles that explain catalytic power and substrate specificity of enzymes; enzyme substrate complex, factors responsible for catalytic efficiency of enzyme; proximity and orientation effect, acid-base catalysis, covalent catalysis, strain and distortion theory;
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	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.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	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, V _{max} , Km and its significance; Lineweaver Burk plot- its advantages and limitations, Eadie- Hofstee and Hanes plots;
15 May, 2022	Sunday

KVA DAV College for Women, Karnal

**Lesson plan for the Even semester
(April, 2022 to June, 2022)**

Name of the Teacher – Manpreet Kaur

Subject- Enzyme Technology

Paper- Paper BT-110

Class- M.Sc. Biotechnology Semester - II

3rdWeek 16 May-21 May	Enzyme inhibition, types of enzyme inhibitions- competitive, uncompetitive, noncompetitive, mixed type inhibition and determination of K_i , feedback inhibition
22 May, 2022	Sunday
May, 2022 4th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5th Week 30 May -31 May	Bisubstrate reactions- brief introduction to sequential and pingpong mechanism with examples. + determination of the molecular weight (M_r) and the number of sub-units of an enzyme; enzyme immobilization and its importance
June 2022 1st week 1 June - 4 June	Strategies used for enzyme production, isolation and purification, method of calculating the purification fold; estimation of enzyme activity; characterization of an enzyme, criteria of enzyme purity,
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2nd Week 6 June –11 June	Protein engineering; enzyme therapy, enzyme inhibitors and drug design; enzymes as biosensors, enzyme reactors; Applications of enzymes in medicine, textile, leather, detergent, paper, bakery, dairy industry, beverage and fruit processing, food processing and preservation, clinical applications of enzyme estimation.

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Manpreet Kaur

Subject- Animal Biotechnology

Paper- Paper BT-121 Animal Biotechnology

Class- M.Sc. Biotechnology Semester - IV

April, 2022 2 nd Week 4April -9 April	Scope, global perspective and new horizons, Historical perspective, and economically important livestock breeds
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Model animals in animal biotechnology and genetic engineering. + Models used in animal genomics.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Somatic Cell Genetics: Production of hybrid cells, Properties of hybrids, Applications hybrid cells
24April, 2022	Sunday
5 th Week 25 April - 30April	Gene Transfer into Animal Cells: DNA transfer techniques into mammalian cells: calcium phosphate precipitation, DEAE-dextran procedure, polycation DMSO, microinjection, electroporation; Selectable markers, viral vectors for gene transfer into mammalian cells: SV40, adenovirus, vaccinia, bovine papiloma virus, baculovirus, retrovirus.
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Transgenic animals: Transgenic mice: Methodology and applications; Transgenic cattle, Livestock transgenesis- production of drugs using animals
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Biotechnology in conservation of livestock diversity, Superovulation, Embryo biotechnology- Embryo collection, evaluation, and transfer, IVF and <i>in vitro</i> embryo production
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Cryobanking of germplasm, oocytes and sperm, Somatic cell nuclear transfer, Stem cells technology in livestock

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Manpreet Kaur

Subject- Animal Biotechnology

Paper- Paper BT-121 Animal Biotechnology

Class- M.Sc. Biotechnology Semester - IV

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Animal cloning: Concepts of animal cloning, Principles and techniques of cloning, Applications of animal cloning.
June 2022 1 st week 1 June - 4 June	Animal genomics: crucial role for health and biomedical sciences. + Livestock in the post genomic era of biology and medicine
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Functional genomics and livestock traits assessment,

Lesson plan for the Even semester
(April, 2022 to June, 2022)

Name of the Teacher – Manpreet Kaur

Subject- Environmental Biotechnology

Paper- Paper BT-120

Class- M.Sc. Biotechnology Semester – IV

April, 2022 2 nd Week 4April -9 April	An overview, concept, scope and market Biological control of air pollution. Bacterial examination of water for potability. Testing of water for physiochemical parameters including BOD & COD.
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Solid waste : Sources and management (composting, wormicomposting and methane production).
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	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. Anaerobic processes: anaerobic digesters, anaerobic filters and upflow sludge blanket reactors. Microbiology and biochemistry of aerobic and anaerobic waste water treatment processes.
24April, 2022	Sunday
5 th Week 25 April - 30April	Treatment of industrial effluents: distillery effluent, paper and pulp mill effluent, tannary effluent, textile dye effluent, removal of heavy metals from waste waters.
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Bioremediation : Bioremediation of fuel oils and lubricants in soil and water. Degradation of sulphur compounds present in coal and petroleum.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Microbial degradation of xenobiotics, genetic engineering of biodegradation pathways.
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Environmental Monitoring: Biosensors for environmental applications, BOD sensor, ammonia sensor, Nitrite sensor and sulphite ion sensor.

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Lesson plan for the Even semester

(April, 2022 to June, 2022)

Name of the Teacher – Manpreet Kaur

Subject- Environmental Biotechnology

Paper- Paper BT-120

Class- M.Sc. Biotechnology Semester – IV

22 May, 2022	Sunday
May, 2022 4th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5th Week 30 May -31 May	Indicator organisms: Safety indicators and Quality indicators
June 2022 1st week 1 June - 4 June	Microbial Insecticides : Bacteria, fungi and viruses. Use of R-DNA technology to enhance the efficacy microbial insecticides. Biofertilizers
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2nd Week 6 June –11 June	Microbes in oil recovery and bioleaching. Biodeterioration of stored plant food materials, leather, wool, metals, textiles, stone & related building. Control of microbial bideterioration