DEPARTMENT OF BIOCHEMISTRY

LESSON PLAN

2020-2021

2020 - 2021

Lesson plan for Even semester

S.No.	Name of the paper	Class
1.	Analytical Biochemistry	I M.Sc
2.	Main practical - I	I M.Sc
3.	SBE: Diseases and Diet Therapy	III B.Sc

Programme	M.Sc. Biochemistry
Programme code	
Semester	II
Course	Analytical Biochemistry
Course code	PCBCD20
Hours/week	5
Credits	5
Total Hours	90 hours
Max. marks	40+60 = 100 marks
Course Tutor	Dr. G. Abi Beaulah.

PCBCD28 - Analytical Biochemistry

Week	Portions to be Covered
1	Unit 1. 1.1 Principle - electrochemical cells 1.2 Henderson - Hasselbalch equation. Buffer capacity.
2	1.3 pH measurement - Glass electrode principle and application. 1.4 Ion-selective electrodes: Principle and application.

Week	Portions to be covered.
3	1.5 Gas sensing electrodes - Oxygen electrode: principle and application. 1.6 Biosensors.
4	Unit 2. 2.1 Planar and Column chromatography: principle and application. 2.2 Ion exchange chromatography: principle and application.
5	2.3 Molecular exclusion chromatography principle and application. 2.4 Gas - liquid chromatography:
6	2.5 HPLC (Normal & Reverse Phase): principle and application. 2.6. Chromatofocussing - Immunoaffinity - Capillary electrochromatography.
7	Unit. 3: 3.1. General principle - Support media for electrophoresis. 3.2 Electrophoresis of proteins - SDS-PAGE, 2D-PAGE (Native Gels & gradient gel)
8	3.3 Isoelectric focusing: Principle & applicatio 3.4 Cellulose acetate electrophoresis.
9	3.5 Detection, estimation and recovery of proteins in gels - Protein blotting 3.6 Electrophoresis of nucleic acids: Agarose gel electrophoresis - DNA sequencing gel - pulse field gel electropho

Week	Portions to be covered.
10	Unit. 4 4.1. Centrifugation - Basic principle 4.2. Preparative ultracentrifugation: Differential and Density gradient centrifuga
11	4.3 Analytical centrifugation: Applications Determination of molecular mass and purity of macromolecules. 4.4 Radioactivity - Nature - Units and interaction of radioactivity with matter
12	4.5 Detection & measurement of radioactivity GM counter - Solid and Liquid scintillation counter - Autoradiography and Cerenkov count 4.6 Applications of radioisotopes in the Biological sciences.
13	Unit. 5. 5.1 Laws of absorption and absorption spectrum - UV-VIS - IR Spectrophotometer: Principle, instrumentation and Applications 5.2. Luminometry - Principle and Applications
14	5.3 FES - Principle, Instrumentation, operation and application. 5.4 FAS - Principle & Application.
15	5.5 NMR, MS, MALDI - Principle and applications. 5.6. Use of lasers for spectroscopy

USBCC617 - SBE: Diseases & Diet Therapy.

Portions to be covered.

1 Food - Role of Food. Food pyramid. classification of food based on chemical nature & biological function.
2 water - Abnormalities associated - Dehydration and over hydration.
3 Dietary fibres - Sources - Healthy benefits - oats.
4 Free radicals - Antioxidants - Antioxidant rich foods.
5 Fruits - vegetables - Spices - cinnamon, cardamom
6 clove, cumin, pepper - Beverages - Greentea, Tea
7 Diseases due to protein - calorie malnutrition and under nutrition - kwashiorkor & marasmus.
8 vitamins - Sources, RDA - functions & Deficiency
Minerals - calcium, Sodium, Iron, Iodine
Sources, RDA, functions & Deficiency diseases.
9 Eating disorders - Anorexia Nervosa, Bulimia Nervosa, Binge eating disorder.
10 Clinical Dietetics - Hypertension, Renal stones.
11 Intestinal worms, Mouth ulcer.
12 Polycystic ovaries, Fibroids, Cancer - ovarian, Cervical and Breast cancer.
13 Health - Definition, Importance of women's health
Healthy tips for women. Anemia - Types -
Iron deficiency anemia.
14 Megaloblastic anemia, Sickle cell anemia,
Causes, Symptoms, diagnosis and treatment.
15 Menstrual cycle and Puberty in females.

2021 - 2022

Lesson plan for Odd semester

S.No.	Name of the Paper	Class
1	Cell Biology	I. M.Sc
2	Main practical - I	I. M.Sc.
3	SBE: Diseases and Diet Therapy	III. BSc.

PCBCC 20 - Cell Biology

Portions to be covered.

Unit. 1.1. Scope of Cell Biology - History of Cell Biology - Cell Theory - Cell Diversity: Size, Shape, Internal organization - Cell types: Prokaryotic and Eukaryotic

Unit. 1.2. Functions of Cell - Prokaryotic Cell: Structural organization with the examples: Mycoplasma, E. coli, Cyanobacteria.

Unit. 1.3. Eukaryotic cell: Structural organization - Plant Cell and Animal cell.

Unit. 1.4 Plasma membrane - Structure - Molecular model of plasma membrane - Functions.

1.5 Specializations of Cell membrane microrilli, Desmosomes, Gap junction Tight junctions, Plasmodesmata - Cell wall - Structure - pits - functions.

Unit. 1.6. Structure, Composition and functions of cilia - Flagella - Filaments - Microtubules - Centrioles - Basal bodies.

Portions to be covered

Unit 2.1. Cellular Organelles: Morphology and functions of Cytoplasm, Nucleus and Nucleolus.

Unit 2.2. Morphology and Functions of Endoplasmic reticulum.

Unit 2.3. Morphology and Functions of Golgi apparatus.

Unit 2.4 Morphology and Function of Mitochondria.

Unit 2.5 Morphology and Function of Plastids.

Unit 2.6. Morphology and Function of Lysosomes and Microbodies.

Unit 3.1 Cell-Cell interaction - Cell adherion proteins - Cell surface of plant, animal and cancer cells.

Unit 3.2. Overview of membrane proteins - peripheral and Integral, molecular model of Cell membrane Fluid mosaic model and membrane fluidity.

Unit 3.3 Transport systems: passive and active transport by ATP powered pumps.

Unit 3.4. Chromosome - structure and Functions.

Unit 3.5 Cell cycle - Phases of Cell cycle - Cell division - Mitosis

Unit 3.6 Cell division: Meiosis - Regulation of Cell growth.

Portions to be covered.

Unit 4.1 Cell aging and death - necrosis and apoptosis

Unit 4.2 Mitochondrial and death receptor pathway.

Unit 4.3 Cell signalling - Types of Cell signaling - Ion channel linked; G. protein coupled receptors.

Unit 4.4 Receptor tyrosine kinases and Ras, MAP kinase pathways.

Unit 4.5 Insulin receptor pathway

Unit 4.6 Functions of Cell surface receptors, pathways of intracellular signal transduction.

Unit 5.1 Methods in Cell Biology: Microscopy - fluorescence, electron microscopy and phase contrast microscope

Unit 5.2 Methods for disrupting tissues and cells, organ and tissue slice techniques.

Unit 5.3 Isolation of clones, tissue culture techniques (Animal and Plant).

Unit 5.4 Cell Fixation - Fluid fixatives, freezing, section drying, fixation for electron microscopy - Buffered osmium solutions, fixation of organic and inorganic substances.

Unit 5.5 Staining Techniques.

Unit 5.6 Histopathological studies - organ specific morpho histological examination, identification of morphological changes related to pathology.

USBCCn19 - SBE : Diseases and Diet Therapy

Portions to be Covered

Unit. 1. Definition of food and Nutrition - Basic food groups - Energy yielding foods - Body Building - Protective foods - Unit of Energy - Bomb calorimeter - Calorific value of proteins, carbohydrates and fats - Basal metabolic rate - Food guide Pyramid

Unit. 2. Nutritive value of Proteins - Protein Malnutrition (Kwashiorkor) Under nutrition (Marasmus) Their preventive and curative measures - Single cell Proteins - Eating disorders - Anorexia Nervosa, Bulimia Nervosa, Binge eating disorder - Therapeutic diets for Anemia, Malnutrition, Diabetes Mellitus Allegy, Jaundice, Diarrhea, Fever.

Unit. 3. Water sources - Functions - water balance Dehydration and over hydration - causes Symptoms, Preventive measures and Treatment Dietary fibres - Sources, Health benefits - Free radicals - Antioxidants : Sources, Types Health benefits.

Unit. 4. Food processing - Food preservation - Food fortification & Nutrient Enrichment - Sanitation and Hygiene in food service - Food toxicities - Chemical contaminants in Food - Value addition of foods.

Unit. 5. Health - Definition, Importance of Women's Health - Health tips for women - Anemia - Types of Anemia causes - symptoms, diagnosis and treatment - Menstrual cycle and Puberty in females - Polycystic ovaries, Fibroids, Cancer - ovarian, Cervical and Breast cancer.

PLAN (EVEN SEM)

PCBCF20 - INTERMEDIARY METABOLISM

WEEK	PORTIONS TO BE COVERED	REFERENCE
1	UNIT : I Oxidative Phosphorylation - Electron Transport System - ATPase : Structure and Mechanism of action. Chemiosmotic theory - mechanism	Lehninger's principles of Biochemistry - W.H Freeman & Co - 4th Edition, 2017. Donald voet - Judith G. voet - Biochemistry - Wiley - 4th Ed. U. Satyanarayana - Biochemistry - Elsevier - 5th Ed
2	Inhibitors of respiratory chain and oxidative phosphorylation - Uncouplers. Mitochondrial Transport System - ATP / ADP exchange Malate and Glycerophosphate Shuttle.	Lehninger's principles of Biochemistry - W.H Freemans & co - 4th Edition, 2017. Donald voet - Judith G. voet - Biochemistry - Wiley - 4th Ed U. Satyanarayana - Biochemistry - Elsevier - 5th Edition.
3	Free energy and Entropy - Enzymes involved in redox reactions. Unit : II Introduction to Carbohydrate Metabolism	Lehninger's principles of Biochemistry - W.H. Freeman and Co - 4th Edition, 2017. U. Satyanarayana - Biochemistry - Elsevier - 5th Edition.
4	Glycolysis - citric acid cycle: Pathway, Key enzymes and regulation. Metabolism of Glycogen : pathway, key enzymes and regulation.	Lehninger's principles of Biochemistry Harper's Illustrated Biochemistry U. Satyanarayana - Biochemistry
5	Gluconeogenesis (Cori cycle) Pathway, key enzymes and regulations. Pentose Phosphate Pathway : Pathway, key enzymes and regulations.	Lehninger's Principles of Biochemistry. Harper's Illustrated Biochemistry. U. Satyanarayana - Biochemistry

WEEK	PORTIONS TO BE COMPLETED	REFERENCE
6	Uronic acid pathway: Pathway, key enzymes and regulations. Metabolism of Galactose and Fructose - Glyoxylate cycle - Pathway Key enzymes and regulations.	Lehninger's Principles of Biochemistry. Harper's Illustrated Biochemistry. U. Satyanarayana - Biochemistry.
7	UNIT - III: Oxidation of fatty acids - Alpha, Beta and Omega Oxidation. Biosynthesis of fatty acids.	Christopher K. Mathews, K.E Van Holde, Kerin G. Ahern - Biochemistry Harper's Illustrated Biochemistry.
8	Metabolism of Ketone bodies Biosynthesis of Triglycerides Metabolism of Phospholipids and Sphingolipids.	Christopher K. Mathews, K.E Van Holde, Kerin G. Ahern - Biochemistry U. Satyanarayana - Biochemistry.
9	Cholesterol - Biosynthesis, Regulation, Transport and excretion.	Christopher K. Mathews, K.E Van Holde, Kerin G. Ahern - Biochemistry U. Satyanarayana - Biochemistry.
10	UNIT - IV: Overview of biosynthesis of Non-essential amino acids Catabolism of amino acid - Transamination, Deamination and Ammonia formation.	Donald Voet - Judith G. Voet - Biochemistry Lehninger's Principles of Biochemistry. U. Satyanarayana - Biochemistry.
11	Urea cycle - Disorders of Urea cycle - Decarboxylation Catabolism of Carbon Skeletons of amino acids: Phenylalanine, Tyrosine and Histidine.	Donald Voet - Judith G. Voet - Biochemistry Lehninger's principles of Biochemistry U. Satyanarayana - Biochemistry

WEEK	PORTIONS TO BE COMPLETED	REFERENCE
12	Catabolism of carbon Skeletons of amino acids: Methionine and cysteine. Detoxification: Oxidation, Reduction, Hydrolysis and conjugation.	Lehninger's Principles of Biochemistry. Christopher K. Mathews K.E Van Holde, Kerin G. Ahern - Biochemistry. Voet & Voet - Biochemistry
13	UNIT - V : Interrelationship of Carbohydrates - protein and fat metabolism. Purine anabolism: De novo and Salvage pathways for biosynthesis - Purine Catabolism.	Lehninger's Principles of Biochemistry. Harper's Illustrated Biochemistry. U. Satyanarayana - Biochemistry
14.	Biosynthesis and catabolism of Pyrimidines. Photosynthesis - photosynthetic apparatus - Light reaction - cyclic and Non cyclic Photophosphorylation	Lehninger's Principles of Biochemistry. Christopher K. Mathews K.E. Van Holde, Kerin G. Ahern - Biochemistry Voet & Voet Biochemistry.
15	Dark reaction - calvin Cycle - Hatch - Slack Pathway. Photorespiration Starch biosynthesis and degradation - Bioluminescence.	Lehninger's principles of Biochemistry. Christopher K. Mathews - Biochemistry. Voet & Voet - Biochemistry

CLASS : I M. Sc Biochemistry

PLAT FORM: Google Meet.

III UG NME SEM-VI

UG18CB601T - THERAPEUTIC AGENTS

EEK	PORTIONS TO BE COMPLETED	REFERENCE
1	UNIT-I: Drug - Definition - Nature - Dosage forms of drugs - Routes of drug administration.	Jayashree Ghosh - A textbook of Pharmaceutical Chemistry.
2	Drug absorption - Drug distribution.	Jayashree Ghosh - A textbo of Pharmaceutical Chemistry.
3	Termination of Drugs Elimination of Drugs- Biotransformation.	Jayashree Ghosh - A text book of Pharmaceutical Chemistry
4	UNIT-II: Vaccines - Definition Attenuated live vaccine - Killed Viral vaccine.	Dulsy Fathima, Arumuga Immunology. F.P. Anita and Philip Abraham - clinical Dietetic and Nutrition.
5	Immunization - Immunization schedule for children.	Dulsy Fathima, Arumugam Immunology. F.P. Anita & Philip Abraham Clinical Dietetics & Nutrition
6	UNIT - III: Antibiotics - Definition Therapeutic Applications of Penicillin and Erythromycin.	Davidson & Henry - clinical Diagnosis by Laboratory Methods. Kanai L. Mukherjee - Medical Laboratory Technol
7	Therapeutic applications of Tetracycline and Streptomycin.	Davidson & Henry - clinical Diagnosis by Laboratory Methods Kanai L. Mukherjee - Medic Laboratory Technology.

WEEK	TOPICS TO BE COMPLETED	REFERENCE
8	Therapeutic applications of Chloramphenicol. Uses of Antiseptics and Disinfectant	Davidson & Henry - Clinical diagnosis by laboratory methods Kanai L. Mukherjee - Medical laboratory Technology
9	Analgesics - Morphine, Pethidine, Paracetamol. Anaesthetics - Chloroform Procaine.	Davidson & Henry - Clinical diagnosis by laboratory methods. Kanai L Mukherjee - Medical laboratory Technology
10	UNIT - IV : Medical Therapies for Mouth Ulcer.	Davidson & Henry - Clinical diagnosis by laboratory methods.
11	Medical Therapies for Gallstones and Urinary stones.	Davidson & Henry - Clinical diagnosis by laboratory methods. Kanai L. Mukherjee - Medical laboratory Technology.
12	Medical therapies for Intestinal worms.	Kanai L. Mukherjee - Medical laboratory Technology.
13	UNIT - V : First Aid : Important Rules of first aid - First Aid Book. First aid for cuts and Abrasions - Bleeding.	Davidson & Henry - Clinical diagnosis by laboratory methods Kanai L. Mukerjee - Medical laboratory Technology.
14	First aid for Fractures Burns - Fainting - Poisonous Bites.	Kanai L. Mukerjee - Medical laboratory Technology.
15	Some common poisons and their antidotes - Acid poisoning - Alkali Poisoning - poisoning by Disinfectant.	Davidson & Henry - Clinical diagnosis by laboratory Methods Kanai L. Mukerjee - Medical laboratory Technology.

SUBJECT: LESSON PLAN

SBC : Medical Laboratory Technology - USBCD19

WEEK	TOPICS TO BE COVERED	REFERENCE
1	Introduction - Medical care, organization of the clinical lab,	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-I Tata McGraw Hill Publishing Ltd, 20
2	Functional components Basic needs - Role of medical Laboratory technician, safety aspects and first aid in the laboratory	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-I Tata McGraw Hill Publishing Ltd, 20
3	Specimen collection : Blood collection by Vein puncture technique - Equipments and storage	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-I Tata Mc Graw Hill Publishing Ltd 2000 2. V.H Talib - A handbook of Medical Laboratory Technology Reprint 2004, CBS Publishers, 2004
4	Anticoagulants	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-I Tata Mc Graw Hill Publishing Ltd, 2000
5	Collection and preservation of urine,	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-I Tata Mc Graw Hill Publishing Ltd, 2000

WEEK	TOPICS TO BE COVERED	REFERENCE
6	Sputum, throat, swab, stool, CSF specimen	1. Kanai L Mukherjee Medical Laboratory Technology, Vol-II, Tata McGraw Hill Publishing Company Limited, 2000
7	Specimen collection: Blood collection and processing for transfusion	1. Kanai L Mukherjee Medical Laboratory Technology, Vol-III Tata McGraw Hill Publishing Company Limited, 2000
8	Preparation for blood collection, screening, rejection, registration of donor	1. Kanai L Mukherjee Medical Laboratory Technology, Vol-III Tata McGraw Hill Publishing Company Limited, 2000
9	Blood collection procedure, transporatation	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-III Tata Mc Graw Hill Publishing Company Limited, 2000
10	Clinical significance of blood transfusion	1. Kanai Mukherjee Medical Laboratory Technology, Vol-III Tata Mc Graw Hill Publishing Company Limited, 2000
11	Urine analysis: Normal and abnormal constituents of urine specimen	1. Kanai L Mukherjee - Medical Laboratory Technology, Vol-II Tata McGraw Publishing, 2000

WEEK	TOPICS TO BE COVERED	REFERENCE
12	Routine examination of urine - Physical examination of urine, colour, appearance, odour and specific gravity. Microscopic examination of urine sediments, blood in urine:	Kanai L Mukher - Medical Labora Technology, Vol Tata McGraw Publishing Ltd 2000
13	Rapid chemical Test of urine. Glucose (Benedicts test), Protein (Heat coagulation test), - Bence Jones protein, Ketone bodies (Nitroprusside test), Bilirubin (Fouchets test)	1. V.H Talib - A handbook of Medical Labora Technology - Reprint 2004, Publisher, 200
14	Histopathology, - Introduction cytology, Laboratory equipment for cytology and histology : Reagents Microscope, microtome	Kanai L Muk - Medical Labor Technology, V Tata McGra Publishing Ltd
15.	Paraffin oven, tissue flotating bath, automated tissue processor and slide warmer - Preparation of tissues for histology collection of specimen for cytological evaluation	

SUBJECT : Microbiology
CODE : Allied Biochemistry-I
UABCA20

WEEK	TOPICS TO BE COVERED	REFERENCE
1	General characteristics, IUB classification, enzyme unit (IU and Katal) - Active site.	Trevor Palmer, Enzymes, Harwood Publishing, 2nd Edition, 2007
2	Lock and key Mechanism and induced fit hypothesis. Effect of temperature, pH and substrate concentration on enzyme activity. Michaelis-Menten equation.	1. Satyanarayana U. Textbook of Biochemistry - 3rd Edition - Books and Allied Private Ltd, 2008. 2. MN Chatterjee Rana Shinde - Text-book of Medical Biochemistry, 7th Ed Jaypee Publisher, 2007
3	Enzyme inhibition - competitive, non-competitive and uncompetitive inhibition; Industrial and Medical applications of enzymes.	Trevor Palmer, Enzymes - Harwood Publishing, 2nd Ed, 2007
4	Diabetes mellitus : Types causes and symptoms. Artherosclerosis : Stages Risk and consequences	Satyanarayana U, Textbook of Biochemistry - 3rd Ed - Books and Allied Private Ltd 2008.
5	Obesity, Gout, Protein calorie malnutrition	MN Chatterjee, Rana Shinde - Textbook of Medical Biochemistry, 7th Ed Jaypee Publisher, 2007

WEEK	TOPICS TO BE COVERED	REFERENCE
6	Marasmus and Kwashiorkor	Chatterjee MN, Rana Shinde - Textbook of Medical Biochemistry 7th Ed, Jaypee Publisher, 2007
7	Glycolysis - Pathway and energities, TCA cycle - energetics - Electron transport chain	Lehninger, David Nelson and M Chael M Cox - Principles of Biochemistry, WH Freeman and Company Ltd, 6th Ed, 2012
8	Beta-oxidation of fatty acids, urea cycle and decarboxylation, Transamination	Lehninger, David Nelson and M Chael M Cox - Principles of Biochemistry
9	Hormones, Receptors, Effectors, Targets - Definition, classification based on nature: Protein steroid and amino acid derived hormone.	A.C Deb - Fundamentals of Biochemistry, New Central Book Agency Ltd, 9th Ed, 2008
10	Insulin Biological functions and disorders, Thyroid hormones - Biological functions and disorders	A.C Deb Fundamentals of Biochemistry, New Central Book Agency Ltd, 9th Ed 2008
11	Oxytocin and vasopressin - Biological functions and disorders	

WEEK	TOPICS TO BE COVERED	REFERENCE
12	Calcuim - Source. RDA. Role of calcuim and deficiency diseases	Jain JL Sanjay Jai Nithin Jain - Fundamentals of Biochemistry S char and Company, 2008
13	Iron - Source, RDA, role and deficiency diseases Potassium - Source, RDA role and deficiency diseases	Satyanarayana U. Texbook of Biochemis -3rd Ed, Books an Allied Private Ltd, 2008
14	Iodine - Source, RDA, role and deficiency diseases Sodium - Source. RDA. role and deficiency disease, Copper - Source	Deb AC - Fundamento of Biochemistry - Ne Central Book Agency Ltd, 9th Edition, 2008.
15	Copper Source, RDA, role of copper and deficiency diseases	Satyanaryana U. Texbook of Biochem -istry - 3rd Edition Books and Allied Private Ltd, 2008

CLASS: I M.Sc BIOCHEMISTRY

SUBJECT: ENZYMOLOGY

1	Nomenclature, classification isolation and purification of enzymes. Determination of enzymes by different method. criteria of purity - Specific activity	1. Trevor Palmer - Enzymes - Biochem -istry, Biotechnolog and clinical chemis - Albion, Reprint Ed 4th Reprint Edition, 2004 2. Enzymes by Boy Academic Press, 3rd Ed, 1983

WEEK	TOPICS TO BE COVERED	REFERENCE
2	Enzyme unit - katal, IU and turnover number. Measurement of enzyme activity - Coupled kinetic assay, kinetic assay using radio labelled substrates	1. Trevor Palmer. Enzyme - Biochemistry, Biotechnology and clinical chemistry - Albion 4th Ed, 2004
3	Active site - Determination of active site amino acids. chemical probe, affinity label and site - directed mutagenesis, instrinsic and extrinsic regulations	1. Trevor Palmer, Enzymes - Biochemistry, Biotechnology and Clinical Chemistry - Albion 4th ed, 2004
4	Investigation of 3-D structure of active site and a brief account of non-protein enzymes - ribozymes and DNA enzymes	
5	kinetics of single substrate enzyme - catalyzed reactions - Michaelis-Menten equation importance of Vmax, Km. MM equation, Lineweaver - Burk plot, Eadie-Hofstee plot, Hanes-Woolf plot and Eisenthal and Cornish Bowden plot, Pre-steady-State kinetics and relaxation kinetics, kinetics of allosteric enzymes - MWC and KNF	1. Athel Cornele-Bowden. Fundamentals of Enzyme kinetics - Athel 2012 2. Enzymes by Boyer - Academic Press - 3rd ed. 1983

WEEK	TOPICS TO BE COVERED	REFERENCE
	models Hill equation co-efficient, kinetics of multi-substrate enzyme-catalyzed reaction -Ping-Pong-bi bi random order and compulsory order mechanism.	B. Trevor Palmer - Ensym Biochemistry, Biotechnology and Clinical chemistry
6	Mechanism of enzymic action - General acid-base catalysis, covalent catalysis, Role of metal ion in enzyme catalysis.	Trevor Palmer- Enzyms Biochemistry, Biotechnology and Clinical chemistry
7	Role of metal ion in enzyme catalysis, Mechanism of serine protease - Chymotrypsin, Lysozyme, Carboxy peptidase A and Ribonuclease, Reversible inhibition - competitive, non-competitive, mixed Allosteric inhibition Irreversible inhibition- suicide inhibition.	Enzymes by Boyer - Academic Press - 3rd Ed, 1983
8	Coenzymes - Prosthetic group, classification -vitamin and non-vitamin coenzymes, thiamine pyrophosphate, Mechanism oxidative and non-	T.D.H Bugg. Introduction to Enzymes & coenzym chemistry, 3rd Ed 2012

WEEK	TOPICS TO BE COVERED	REFERENCE
9	oxidative decarboxylation transketolase reaction FMN and FAD - flavo-protein enzymes - mechanism of oxidative and reduction of flavin enzymes	Trevor Palmer - Enzymes : Biochemistry Biotechnology and Clinical Chemistry Albion, 4th ed, 2004
10	NAD and NADP role in enzyme catalyzed reaction PALP and PAMP - role of PALP in transamination and decarboxylation reaction, Coenzyme A involved reaction.	T.P.H Bugg - Introduction to Enzymes and coenzyme Chemistry 3rd Ed, 2012
11	Biotin - carboxylation reaction, folate coenzyme coenzyme role of vitamin B12 and vitamin C metabolite and non-vitamin coenzymes, lipoic acid, coenzyme Q nucleoside triphosphate and S-adenosyl methionine. Isoenzyme.	Trevor Palmer - Enzymes - Biochemistry Biotechnology and Clinical Chemistry 4th ed, 2004
12	Industrial uses of enzymes - source of industrial enzymes, thermophilic enzymes amylase, glucose	Trevor Palmer - Enzymes - Biochemistry Biotechnology and Clinical Chemistry 4th Ed, 2004

WEEK	TOPICS TO BE COVERED	REFERENCE
	oxidases, cellulose degrading enzymes, lipases, proteolytic enzymes in meat and leather industry, detergents and cheese production	
13	Clinical enzymology - Enzymes as thrombolytic agents, anti-inflammatory agent, digestive aids.	Stewen- Diagnostic Enzymology, 2nd Ed. 2014
14	Therapeutic use of Asparaginases, Therapeutic use of Streptokinase	Trevor Palmer - Enzymes, Biochemistry Biotechnology and Clinical Chemistry Albion, Reprint Ed 4th Reprint, 2004
15	Enzymes and isoenzymes in diagnosis - LD, CK, Transaminases, Phosphatase Amylase and cholinesterase Immobilization of enzymes and their applications	

LESSON PLAN FOR EVEN SEMESTER

PAPER	CLASS
CELL BIOLOGY	I B.Sc BIOCHEMISTRY
MAIN PRACTICAL-I	I B Sc BIOCHEMISTRY
CLINICAL BIOCHEMISTRY	III B.Sc. BIOCHEMISTRY
MAIN PRACTICAL-III	III B Sc BIOCHEMISTRY
VALUE EDUCATION	II B.Sc. PHYSICS.

I B.Sc. BIOCHEMISTRY - CELL BIOLOGY (UCBCB20)

WEEK	PORTION TO BE COVERED	REFERENCE
1	UNIT 1: 1.1. An overall view of cells - origin - evolution of cells - Cell theory. 1.2. Cell organization: Types of Cell - Structural organization of Prokaryotic (E.coli) and Eucaryotic cells (Animal and Plant cell).	Harvey Lodish. Molecular Cell Biology. WH Freeman, 8th edition, 2016.
2	1.3. Comparison between Plant cell and animal cell structure. 1.4. Virus cell structure: T4 Bacteriophage, corona virus.	De Robertis - Cell and Molecular Biology, Lippincott Williams 8th edition, 2017
3	1.5. An Overview of molecular organization of cells - Micro filaments (Actin and Intermediary filament), Microtubules, centrioles, Basal bodies, cilia, flagella.	De Robertis - Cell and Molecular Biology. Lippincott Williams, 8th edition, - 2017

WEEK	PORTION TO BE COVERED	REFERENCES
4	UNIT II: 2.1. Components and functions of Organelles: Structure and functions of Mitochondria. 2.2. Endoplasmic reticulum - Rough and Smooth endoplasmic reticulum.	Harvey Lodish. Molecular Cell Biology. WH Freeman, 8th edition, 2016.
5	2.3. Structure and functions of Ribosomes. 2.4. Structure and functions of Golgi apparatus	Verma S and Agarwal V K. - Cell Biology, Genetics & Molecular Biology - S Chand & company Ltd, 2005
6	2.5. Structure and functions of Lysosomes - Chloroplast. 2.6. Structure and functions of peroxisomes and Glyoxysomes.	Harvey Lodish. Molecular Cell Biology. WH Freeman, 8th edition, 2016
7	UNIT III: 3.1. Nucleus: Nuclear membrane, nucleolus, nuclear pore and annulus. 3.2. Structure of chromosomes.	De Robertis - Cell and Molecular Biology. Lippincott William, 8th edition 2017
8	3.3. Functions of chromosomes 3.4. Materials of chromosomes.	Powar CB - Cell Biology - Himalaya Publishing House, 2016
9	3.5. Cell cycle - Overview - Cell Division - Mitosis 3.6. Cell Division - Meiosis I and II	Harvey Lodish. Molecular Cell Biology WH Freeman, 8th edition, 2016
10	UNIT IV: 4.1. Cell membrane: Molecular organization of animal cell membrane. 4.2. Membrane lipids, Proteins and Carbohydrates.	Dalela A Verma Text of cytology - Jai prakash Nath and Co, 2000.

WEEK	PORTION TO BE COVERED	REFERENCES
11	4.3. The fluid Mosaic Model and artificial membranes. 4.4. Structure of Mitochondrial membrane.	Becker and Hardin - The World of cell. Acaden Interne Publishers. 9th edition, 2016.
12	4.5. Structure of Red cell membrane. 4.6. Cell wall: Components and role of cell wall.	Becker and Hardin - The World of cell. Acaden Internet Publishers. 9th edition, 2016.
13	UNIT V: 5.1. Membrane functions: cell permeability, Ion selective channels (Uniport, Antiport, Symport with example) and carriers. 5.2. Transport processes, Diffusion, facilitated diffusion	De Robertis - cell and Molecular Biology, Lippincot Williams, 8th edition - 2017.
14	5.3. Active transport proteins (Na+, k+ ATpase), Ionophores 5.4. Types of cell junctions: Gap junctions and tight junctions.	Dalela A Verma Text book of Cytology - Jai Prakash Nath and Co, 2000
15	5.5. Cell - Cell communication (Belt and Spot desmosomes) 5.6. Cell adhesion proteins: Integrin, Cadherin and Selectin.	Harvey Lodish. Molecular Cell Biology. WH Freeman, 8th edition, 2016.

PLATFORM: Google Meet

III B.Sc BIOCHEMISTRY - CLINICAL BIOCHEMISTRY (17CBSK16)

WEEK	PORTIONS TO BE COVERED	REFERENCE
1	UNIT 1: Diseases related to Carbohydrate metabolism- Hypo and hyperglycemia, Renal thereshold value and TMG.	Carl A Burtis, Edward R. Ashwood Tietz - Fundamentals of Clinical Chemistry, 6th edition, Harcourt pvt ltd, New Delhi, 2002
2	Diabetes mellitus - types, etiology, clinical features and complications, Diabetic ketoacidosis - significance of fasting and Post parandial blood glucose.	Dr M N Chatterjea and Rana Shinde - Textbook of Medical Biochemistry 8th edition, Jaypee Brothers, New Delhi, 2011.
3	Glucose Tolerance Test - Glycosylated Hb - Galactosemia, Fructosuria, Glycogen storage diseases.	Davidson and Henry - Clinical Diagnosis by Laboratory Methods 21th ed, 2007
4	UNIT II: Diseases related to lipid: Lipoproteins - Types and functions, Atherosclerosis, Ischemic heart disease (IHD), obesity	Dr M.N. Chatterjea and Rana Shinde - Textbook of Medical Biochemistry 8th ed, Jaypee Brothers. Medical Publishers Ltd New Delhi
5	Factors affecting Blood Cholesterol level, Hypercholesterolemia, Elementary details of Hypo and Hyper lipoproteinemia - Fatty liver, cirrhosis-	Dr M.N. Chatterjea and Rana Shinde - Text book of Medical Biochemistry, 8th ed, Jaypee Brothers. Medical Publishers Ltd, New Delhi, 2011.
6	Inborn errors of Aminoacid Metabolism - Phenyl ketonuria, Alkaptonuria, cystinuria, Hemophilia, Albinism ...	Laurence A. Kalpan, Amadeo J. Pesce, Steven C. Kazmierzak Clinical Chemistry ...

WEEK	PORTION TO BE COVERED	REFERENCES
7	UNIT III: Liver function test - Metabolism of Bilirubin - Jaundice - types	Davidson and Henry - clinical Diagnosis by Laboratory Methods, 21th ed, 2007.
8	Liver function test based on abnormalities of pigment metabolism - Vanden bergh reaction and Urine bilirubin	Davidson and Henry - clinical Diagnosis by Laboratory Methods, 21th ed, 2007.
9	Galactose tolerance test - BSP test - prothrombin time - Enzymes of Diagnostic Importance - AST, ALP, CPK, LDH.	Philip D Mayne - clinical Biochemistry in Diagnosis & Treatment, 6th ed, ELST Publishers, 1998.
10	UNIT IV: Renal function tests - Glomerulonephritis, Nephrotic syndrome - clearance - Definition and types	Davidson and Henry clinical Diagnosis by Laboratory Methods, 21st edition, 2007
11	Renal function tests based on glomerular filtration (urea and creatinine clearance), Renal plasma flow (PAH test), Tubular function - phenol sulphatherein test	Dr. M. N. Chatterjee and Rana Shinde - Text book of Medical Biochemistry, 8th ed, Jaypee Brothers, Medical Publishers Ltd, New Delhi, 2011.
12	Gastric function test - Collection of gastric contents, Examination of gastric residuum, FTM, stimulation test - Alcohol, Caffeine and Histamine.	Alan H. Gowenlock, Janet R. Mc. Murray, Donald M. Mc. Lauchlan - Varley's Practical clinical Biochemistry 6th ed, CBS Publishers, 2006

WEEK	PORTION TO BE COVERED	REFERENCE
13	UNIT V: Diagnostic enzymes and Tumor markers - SGOT, SGPT, Alkaline phosphatase	Dr. M.N Chatterjea and Rana Shinde - Textbook of Medical Biochemistry 8th ed, Medicinal Publishers.
14	Amylase, Streptokinase - Cancer Etiology - Morphological Changes in tumour cells -	Dr. M.N Chatterjea and Rana Shinde - Textbook of Medical Biochemistry 8th ed, Medicinal Publishers.
15	Tumour Markers - AFP, CEA and HCG.	Lawrence A Kaplan, Amadeo J Perez, Steven C. Kamnier zak - Clinical Chemistry, 5th ed, Illustrated, Revised.

PLATFORM : Google Meet

III B.Sc., BIOCHEMISTRY - UCBCL16 - MAIN PRACTICAL III

WEEK/ MONTH	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
Jan	Quantitative Estimation: 1. Estimation of protein by Biuret method and determination of A/G ratio. 2. Estimation of Uric acid by Caraway's Method 3. Estimation of Creatinine by Jaffe's method 4. Estimation of cholesterol by Zak's Method	Dr. J. Jayaraman Manuals in Biochemistry - New Age International Publishers, 2001. 2. Varley, Alan H. Gowenlock - Practical Biochemistry - 6th ed, CBS Publishers, 2002	Lab
Feb	5. Estimation of Bilirubin by Vandenbergh method 6. Estimation of urea by Diacetyl Monoxime method	3. David T. plummer - Practical Biochemistry, 3rd ed,	

WEEK / MONTH	PORTION TO BE COVERED	REFERENCE	PLATFORM
	7 Estimation of Glucose by orthotolvichne Method 8 Estimation of DNA by Diphenyl amine Method 9. Estimation of RNA by Orcinol Method Preservation of blood and Veine for analysis Qualitative analysis of Veine for normal and abnormal constituents	Mc Graw Hill Publishers - 2005 4. S. K. Sawhney Randhir Singh - Introductory Practical Biochemistry - 2nd edition - Narosa Publishers. 2001.	Lab
Mar	Enzyme Analysis: 1. Determination of SGOT 2. Determination of SGPT 3 Effect of pH on the activity of enzymes - Acid phosphatase 4. Effect of Temperature on the activity of the enzymes - Acid phosphatase 5. Effect of substrate Concentration on the activity of the enzyme - Acid Phosphatase 6. Determination of specific activity of the enzyme - Acid phosphatase Hematological Experiments (Demonstration): 1. Enumeration of RBC and WBC		Lab.

WEEK/MONTH	PORTIONS TO BE COVERED	REFERENCES	PLATFORM
	2. Estimation of Erythrocyte Sedimentation rate 3. Determination of Haemoglobin. 4. Blood grouping. 5. Packed cell volume.		Lab

WEEK PLAN FOR 2020-2021

Date	Hour	Class	Portions Covered	Platform
4.1.2021	IV	III B.Sc. Biochemistry	Introduction to Carbohydrate metabolism.	Google Meet and Power Point Presentation
	I to III	I. BSc. Biochemistry Main - Practical - I		
5.1.2021	I	III B.Sc. Biochemistry	Hyperglycemia	Google Meet and Powerpoint Presentation
	II, V	I. Bsc. Biochemistry	Overview of Cells - Origin & evolution of cells, cell theory.	
6.1.2021	II	III B.Sc. Biochemistry	Hyperglycemia.	Google Meet and Power Point Presentation
	III	II Bsc. Physics - VE	Social Analysis	
	I	I Bsc. Biochemistry	Cell organisation of Prokaryotes & Eucaryotes, types of cells.	

LESSON PLAN FOR EVEN SEMESTER

III B.Sc Biochemistry

Pharmacology - UEBCE 16 (ELECTIVE III A)

Week	Portions to be covered	References	Pbl:
	UNIT-I		
1	Introduction: Sources, Dosage forms, Route of administration	1. Satoskar, R.S., Bhandarkar and S.S. Alrapure - pharmacology & pharmacotherapeutics, 14th Edition	Google Meet & CLASS
2.	Classification - absorption of drugs	2. S.D. Seth - Text-Book of pharmacology 2nd Edition	Google Meet & CLASS
3.	Binding of drugs to plasma proteins (Distribution)	2. S.D. Seth - Text-book of pharmacology 2nd Edition	Google Meet & CLASS
	UNIT-II		
4	Receptor - Types, Binding forces in Drug - receptor interaction and consequence of Drug - receptor interaction	2. William-Raye principles of Medical Biochemistry 3rd Edition - 1986	Google Meet & CLASS

Week	Portions to be covered	References	Platform
5.	Xenobiotics - phase I - Mechanism of oxidation, reduction, hydrolysis	2. William Foye - principles of Medical chemistry 3rd Edition - 1986	Google Meet & CLASS
6.	Xenobiotics - phase II - conjugation UNIT - III	2. William Foye - principles of Medical chemistry 3rd Edition - 1986	Google Meet & CLASS
7	Antibiotics : structure and therapeutics uses of Penicillin, streptomycin, Tetracyline, chloramphenicol and Erythromycin	4. Graham, D.G., Smith and Arason, J.K.) - Oxford Textbook of clinical pharmacology and drug therapy	Google Meet & CLASS
8.	Antiseptics and Disinfectant Structure and uses of i) phenols and related compounds a) Alkyl substituted phenols, cresol, Thymol. b) chlorinated phenols : Chloroxylenol	2. William Foye principles of Medical chemistry, 3rd Edition - 1986	Google Meet & CLASS
9	ii) Halogen compounds - chloramine; iii) organic mercurial - Thiomersol iv) Formaldehyde and its derivatives - Formaldehyde v) Nitrofuran derivatives - Nitrofurazone	2. William Foye principles of Medical chemistry, 3rd Edition - 1986	Google Meet & CLASS

Week	Portions to be covered	References	
	UNIT-IV		
10	Cardiovascular Drugs - structure and action of cardiac glycosides - Digoxin and Digitoxin; Anti arrhythmic Drugs - structure and use of Propanolol and procainamide	A. Graham, D.G. Smith and Anson, J.K.) - Oxford Textbook of pharmacology and Drug therapy	Group Meeting & CLASS
11.	Antihypertensive agents i) Drugs acting centrally Example clonide, alpha methyl Dopa, ii) Ganglion blockers - Example: Pentolinium Tartarate	1. Satoskar R.S., S.S. Ainapure - pharmacology and pharmacotherapeutics 14th Edition	Group Meeting & CLASS
12.	iii) Vasodilators - Example Pentolinium Tartarate, Tolazaline, iv) β-blockers Example: phenoxybenzamine structure and use of oral hypoglycemic drugs.	1. Satoskar R.S., S.S. Ainapure - pharmacology and pharmacotherapeutics 14th Edition	Group Meeting & CLASS
	UNIT-V		
13	Analgesics - Morphine, Pethidine, Aspirin, Salicin, para acetemol and phenacetin	William Foye principles of Medical chemistry 3rd Edition - 1986	Group Meeting & CLASS

Week	portions to be covered	References	platform
14	Analgin and Indomethacin; Anesthetics - chloroform, Nitrous oxide	William Foye principles of Medical chemistry 3rd Edition-1986	Google Meet & CLASS
15	Trichloro ethylene, Benzocaine, procaine, Ligno caine, cytotoxic agents - chlorambucil	William Foye principles of Medical chemistry 3rd Edition-1986	Google Meet & CLASS

SKILL BASED ELECTIVE II

HEALTHCARE FOR WOMEN - USBCBn19

Week	portions to be covered	References	platform
1	UNIT-I Health - definition, Importance of women's health, Healthy tips for women	victoria Maizes - Integrative women's health 4th Edition	google Meet
2	Anemia; Types - Iron deficiency anemia, Megaloblastic anemia - causes, Diagnosis & Treatment	victoria Maizes - Integrative women's health 4th Edition	google Meet
3.	preventive care benefits for women	victoria Maizes - Integrative women's health 4th Edition	google Meet

dock	portions to be covered	References
	UNIT-II	
4	physiological anatomy of female reproductive systems	Ross and Wilson Anatomy and physiology in health and illness 10th Edition, 2008
5	Hormones Related with females - Estrogen and progesterone	victoria Maizes - Integrative Medicine Women's health - 4th Edition
6	Depression - Blood pressure osteoporosis - obesity	N. Murugesh - Health Education and community - pharmacy satya publishing 4th Edition - 2005
	UNIT-III	
7	ovarian cancer, cervical cancer, polycystic ovaries	N. Murugesh - Health Education and community - pharmacy Satya publishing 4th Edition - 2005
8.	Fibroids - Types, causes, symptoms, Diagnosis and Treatment	N. Murugesh - Health Education and community - pharmacy satya publishing 4th Edition - 2005
9	HIV, HSV - Prevention and Treatment	N. Murugesh - Health Education and community - pharmacy Satya Publishing

Week	Portions to be covered	References	Platform
	UNIT-IV		
10	Female Infertility, Amenorrhea - causes, Symptoms, Diagnosis, signs & Test, Treatment	Victoria Maizes, Integrative Medicine Woman's health 4th Edition	Google Meet
11.	Puberty - Menopause	Victoria Maizes, Integrative medicine Woman's health 4th Edition	Google Meet
12.	Endometriosis - vaginal Discharge	Victoria Maizes & Elsevier notes	Google Meet
	UNIT-V		
13.	Urinary Infection, Role of thyroid hormones in Women	N. Murugesh - Health Education and community - Pharmacy Satya Publishing 4th Edition - 2005	Google Meet
14.	Blood group system	N. Murugesh - Health Education and community - pharmacy Satya Publishing 4th Edition - 2005	Google Meet
15	Rh factor, Erythroblastosis foetalis	N. Murugesh - Health Education and community pharmacy satya Publishing. 4th Edition - 2005	Google Meet

NON MAJOR ELECTIVE IV

DISEASES AND TREATMENT (UGHBCR59)

Week	Portions to be covered	References	Platform
	UNIT-I		
1	Diseases and Its types Immune system - Types - Innate and Acquired - phagocytosis	Richard A. Goldsby, Thomas J Kindt, Barbara A Osborne, Janis Kuby - Immunology - 5th Edition W H. Freeman and company, 2003	Google Meet & CLASS
2.	Blood : composition, sickle cell anemia, Iron deficiency anemia, Leucopenia, Hemolysis, Blooding Disorders	Davidson - Principles and practice of Medicine - 9th Edition Elsevier Publication, 2002	Google Meet & CLASS
3	Bone Disorders: osteomalacia, Rickets, Joint pain	Davidson_ principles and practice of Medicine 9th Edition, Elsevier Publication, 2002	Google Meet & CLASS
	UNIT-II		
4	Asthma, Tuberculosis, causes, clinical features prevention and Treatment	Davidson. Principles and practice of Medicine 9th Edition, Elsevier Publication, 2002	Google Meet & CLASS
5.	Liver diseases (Jaundice): causes, clinical features Prevention and Treatment	Davidson - Principle of practice of Medicine 9th Edition, Elsevier Publication, 2002	Google Meet & CLASS

Week	Portions to be covered	References	platform
6	Hepatatitis : causes, clinical features, prevention and Treatment UNIT-III	Davidson-principles and practice of Medicine, 9th Edition Elsevair publication, 2002	Google Meet & CLASS
7	Diabetes Mellitus : causes, clinical features, Diagnosis, Prevention and Treatment	Ada p khan - Diabetes causes, prevention and Treatment - orient Paperbacks, 2004	Google Meet & CLASS
8.	Cancer: causes, clinical features, Diagnosis, Prevention and Treatment	Davidson-Principles and practice of Medicine, 9th Edition Elsevair Publication - 2002	Google Meet & CLASS
9.	AIDS : causes, clinical features, Diagnosis, prevention and Treatment	Richard A. Goldsby, Thomas J Kindt, Barbara A osborne, Janis kuby - Immunology 5th Edition, W.H. Freeman and company, 2003	Google Meet & CLASS
	UNIT-IV		
10	Cardiovascular diseases : Hypertension, Heart attack - causes, clinical features and Treatment	Davidson - principles and practice of Medicine, 9th Edition Elsevair Publication - 2002	Google Meet & CLASS
11.	Neurological Diseases : Dementia - causes, clinical features and Treatment	Davidson - Principles of and practice of Medicine, 9th Edition Elsevair Publication - 2002	Google Meet & CLASS

Week	Portions to be covered	References
12	Seizures, coma - causes clinical features and Treatment. Autism - causes, clinical features and Treatment.	Davidson - principles and practice of Medicine - 9th Edition, Elsevier publication, 2002
	UNIT - V	
13	Skin diseases: Alopecia Areata, causes, clinical features and Treatment	Virendar N Sehgal - Diagnosis and treatment of common skin diseases - 5th Ed - Jaypee Brothers Medical Pub - 2016
14.	Hirsutism, Psoriasis - causes, clinical features and Treatment	Virendar N. Sehgal - Diagnosis and treatment of common skin diseases - 5th Ed - Jaypee Brothers Medical Pub - 2016
15.	Acne vulgaris and Dandruff - causes, clinical features and Treatment	Virendar N. Sehgal - Diagnosis and treatment of common skin diseases - 5th Ed - Jaypee Brothers Medical Pub - 2016

LESSON PLAN FOR EVEN SEMESTER

III B.Sc., Biochemistry

UCBCT16 - Molecular Biology

Week	Portions to be Covered	Reference	Platform
	UNIT I:		
1	Genetics: Mendel's laws of inheritance, test cross, back cross and law of incomplete dominance.	1. David Friefelder - Molecular Biology, 2nd Edition - Narosa Publishing House. 2005.	Google Meet
2	Structural and Genomic organization of Prokaryotes and Eukaryotic Cells.	2. Lodish, Darnell and Baltimore - Molecular Cell Biology - 4th Ed. W.H. Freeman & Company. 2000	Google Meet
3	Evidences for DNA as genetic material - Griffith, Avery et al and Hershey - chase experiments - Central dogma of molecular genetics - Repetitive DNA.	3. Benjamin Lewin - Gene VIII, 8th edition - Pearson Education International. 2004	Google Meet
	UNIT II:		
4	Prokaryotic replication: Modes of replication - Experimental Evidences of Semi Conservative	1. David friefelder - Molecular Biology, 2nd Edition - Narosa Publishing House. 2005	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
	replication	2. Lehninger, David Nelson and M. Chael M. Cox - Principles of Biochemistry - 4th Ed - W.H. Freeman and Company Ltd. 2005.	
5	Process of Prokaryotic replication - Initiation, Elongation and Termination		Google Meet
6	Enzymes and Proteins involved in replication - Inhibitors of replication - An Overview of DNA repair.	3. Ledish, Donnell and Baltimore - Molecular Cell Biology - 4th Ed. W.H. Freeman & Company 2000	Google Meet
	UNIT III:		
7	Prokaryotic transcription: Promoters - Process of Prokaryotic transcription - Initiation, Elongation and Termination.	1. Lehninger, David Nelson and M. Chael M. Cox - Principles of Biochemistry - 4th Ed - W.H Freeman and Company Ltd. 2005	Google Meet
8	Enzymes and proteins involved in transcription - Inhibitors of transcription	2. David Friefelder - Molecular Biology, 2nd Edition - Narosa Publishing House. 2005.	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
9	Post transcriptional Processing of rRNA and tRNA in prokaryotes. Reverse transcription.	3. Lodish, Darnell and Baltimore – Molecular Cell Biology – 4th Ed. W. H. Freeman & Company. 2000.	Google Meet
	UNIT IV :		
10	Genetic code dictionary – General features – Wobble hypothesis – Composition of Prokaryotic and Eukaryotic ribosome	1. David Friefelder – Molecular Biology, 2nd Ed – Narosa Publishing House. 2005.	Google Meet
11	Process of Protein Synthesis in Prokaryotes – Initiation, Elongation and Termination.	2. Benjamin Lewin – Gene VIII, 8th Ed – Pearson Education International. 2004	Google Meet
12	Inhibitors of Protein synthesis in prokaryotes – Post translational modification	3. Lodish, Darnell and Baltimore – Molecular Cell Biology – 4th Ed. W. H. Freeman & Company. 2000	Google Meet
	UNIT V :		
13	Regulation of gene expression in prokaryotes: Operon concept – lac operon – Mutation: Definition, Classification with example.	1. David Friefelder – Molecular Biology, 2nd Edition – Narosa Publishing house. 2005.	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
14	An Overview of Genomics, Human Genome Project, Structural genomics, Chromosome maps - Functional genomics.	2. T.A Brown - Gene Cloning, 4th Edition - Blackwell Science. 2001	Google Meet
15	An Overview of Proteomics - DNA micro arrays.	3. Benjamin Lewin - Gene VIII, 8th Ed. - Pearson Education International. 2004	Google Meet

I M.Sc., Biochemistry

PEBCC 20 - Elective II A: Ecology, Evolution and Developmental Biology.

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
1	UNIT I : 1.1 Physical environment, biotic environment, biotic and abiotic interaction. 1.2 Concept of habitat and niche, niche width and Overlap, fundamental and realized niche	1. David C - Advanced Molecular Biology, Delve Publishing LLC, 2015 2. William H. Elliot & Daphne C. Elliot -	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
2	1.3 Characteristics of a population, population growth curves, population regulation.	Biochemistry and Molecular Biology, Oxford University Press, 2018.	Google Meet.
	1.4 Nature of Communities, Community structure and attributes, level of Species diversity and its measurement.	3. Gilbert S.F – Developmental Biology – Sinauer Associates Inc., Massachusetts – 11th Edition, 2016.	
3	1.5 Types and Mechanism of Succession, Concept of climax.		Google Meet.
	1.6 Types of interaction, interspecific competition, herbivory, pollination, Symbiosis.	4. Balinsky B. I – An Introduction to Embryology – W. B. Saunders Publishing Company – 5th Edition, 2014.	
	UNIT II:		
4	2.1 Lamarck; Darwin Concept of Variation, adaptation, natural Selection.		Google Meet.
	2.2 Origin of basic biomolecule; Abiotic Synthesis of Organic monomers and polymers		

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATF...
5	2.3 Concept of neutral evolution, molecular divergence and molecular clock. 2.4 Population genetics - Populations, gene pool - gene frequency, Hardy - Weinberg law.	1. David C. — Advanced Molecular Biology, Delve Publishing LLC, 2015 2. William H. Elliot & amp; Daphne C. Elliot - Biochemistry and Molecular Biology, Oxford University Press, 2018 3. Gilbert S.F. - Developmental Biology - Sinaer Associates Inc. Massachusetts - 11th Edition, 2016.	Google Meet
6	2.5 Adaptive radiation, Isolating mechanisms. Speciation, Allopatricity and Sympatricity. 2.6 Convergent evolution, Sexual selection, Co-evolution.		Google Meet
	UNIT III :		
7	3.1 Production of gametes 3.2 Cell Surface molecules in sperm - egg recognition in animals.		Google Meet
8	3.3 Embryo sac development. 3.4 Double fertilization in plants.		Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
9	3.5 Mammalian Cleavage, gastrulation 3.6 Programmed cell death UNIT IV:	4. Balinsky B.I - An Introduction to Embryology - W. B. Saunders Publishing Company - 5th Edition, 2014.	Google Meet.
10	4.1 Organization of Shoot and root apical meristem 4.2 Shoot and root development.		Google Meet
11	4.3 Leaf development and phyllotaxy. 4.4 Transition to flowering, floral meristems.		Google Meet
12	4.5 Floral development in Arabidopsis. 4.6 Antirrhenum UNIT V:	1. David e. - Advanced Molecular Biology, Delve Publishing LLC, 2015.	Google Meet
13	5.1 Linkage maps, mapping with Molecular markers 5.2 Mapping by using Somatic cell hybrids, development of mapping population in plants.		Google Meet
14.	5.3 Pedigree analysis 5.4 LOD Score for linkage testing	2. William H. Elliot & Amp; Daphne C. Elliot -	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
15	5.5 Karyotypes. Polygenic inheritance, heritability and its measurements. 5.6 ATL mapping	Biochemistry & Molecular Biology, Oxford University Press, 2018.	Google Meet

III B.Sc., Biochemistry

VCBCL16 – Main practical III

WEEK / MONTH	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
JAN	Quantitative Estimations: 1. Estimation of protein by Biuret method and determination of A/G ratio. 2. Estimation of Uric acid by Caraway's method. 3. Estimation of Creatinine by Jaffe's method. 4. Estimation of Cholesterol by Zak's method.	1. Dr. J. Jayaraman - Manuals in Biochemistry – New Age International Publishers, 2001. 2. Varley, Alan. H. Gowenlock - Practical Biochemistry – 6th Edition – CBS publishers. 2002.	Lab

MONTH	PORTIONS TO BE COVERED	REFERENCE	PLATFORM
FEB	5. Estimation of Bilirubin by Vandenbergh method 6. Estimation of Urea by diacetyl monoxime method. 7. Estimation of glucose by Orthotoluidine method 8. Estimation of DNA by diphenyl amine method 9. Estimation of RNA by Orcinol method. Preservation of blood and Urine for analysis Qualitative analysis of Urine for Normal and abnormal constituents.	3. David T. Plummer - Practical Biochemistry, 3rd Edition - McGraw Hill Publishers - 2005. 4. S. K. Sawhney, Randhir Singh - Introductory Practical Biochemistry - 2nd Edition - Narosa Publishers. 2001.	Lab
MAR	Enzyme Analysis: 1. Determination of SGOT 2. Determination of SGPT 3. Effect of pH on the activity of the enzymes - Acid phosphatase 4. Effect of temperature on the activity of the enzyme - acid phosphatase		

MONTH	PORTIONS TO BE COVERED	REFERENCE	
	5. Effect of substrate concentration on the activity of the enzymes- Acid phosphatase 6. Determination of Specific activity of the enzyme - Acid phosphatase Hematological Experiments (Demonstration) 1. Enumeration of RBC and WBC. 2. Estimation of Erythrocyte Sedimentation rate. 3. Determination of haemoglobin 4. Blood grouping 5. Packed Cell Volume.		Lab

II B.Sc Biochemistry

UCBCE19 - PHYSIOLOGY

WEEK	PORTION TO BE COVERED	REFERENCE	PLAT FORM
1.	UNIT: 1 Nutrition: Nutrients - Balanced diet - Nutional Status - Food groups - RQ	1. Swaminathan MS - Principles of Nutrition 2. Davidson and Passmore - Human Nutrition & Dietetics - 8th Ed.	Google Meet
2.	SDA, BMR, Definition and Measurement, Bomb Colorimeter, Caloric Value of food.	1. Swaminathan MS - Principles of Nutrition 2. Davidson & Passmore - Human Nutrition & Dietetics - 8th Ed	Google Meet
3.	Adverse Effects of Fast Foods - Brief Outline on the Common adulterants in food	1. Swaminathan MS - Principles of Nutrition 2. Davidson & Passmore - Human Nutrition & Dietetics - 8th Ed	Google Meet
	Unit : 2		
4.	Respiratory System: Overview of respiratory system. Exchange of Gases - Circulation: Blood composition and Functions.	1. Ross, Wilson - Anatomy and physiology in Health & illness - 2. chatterjee. CC - Human physiology - 11th Ed.	Google Meet

WEEK	PORTION TO BE COVERED	REFERENCE	PLAT FORM
5.	Types of Blood cells – Morphology & Function – ABO blood groups, Blood coagulation	1. Ross, wilson – Anatomy and physiology in Health & illness – 13th Ed 2. Chatterjee CC – Human Physiology – 11th Ed	Google meet
6.	Structure of Heart & Blood vessels, Cardiac cycles and – Blood Pressure (Diastolic, Systolic, Normal Blood pressure) Normal ECG Curve.	1. Ross, Wilson – Anatomy and physiology in Health & illness – 2. Chatterjee CC – Human physiology – 11th Ed	Google Meet
	Unit : III		
7.	Digestive System : Structure and function of different components of digestive system, Digestion, Absorption	1. Ross, Wilson – Anatomy & physiology. in Health & illness – 2. Chatterjee CC – Human physiology – 11th Ed	Google Meet.
8.	Nutrional significance of Carbohydeates, Lipids, Protein	1. Ross, Wilson – Anatomy & physiology in Health & illness 2. Chatterjee CC – Human physiology	Google Meet.
9.	Role of Bile salts in Digestion and absorption – Mechanism of HCl and Gastric juice formation in stomach	1. Ross, Wilson – Anatomy & physiology in Health & illness 2. Chatterjee CC – Human physiology.	Google Meet.

Week	PORTION TO BE COVERED	REFERENCE
	Unit : 4	
10.	Excretory System : Structure of kidney, Nephron - Composition & Formation of Urine	1. Ross, Wilson - Anatomy and physiology in Health & illness - 13th Ed 2. Chatterjee CC - Human Physiology
11.	Urine - Filtration, Active and Passive transport of various substances and secretion.	1. Ross, Wilson - Anatomy and Physiology in Health & illness - 2. Chatterjee CC - Human physiology
12.	Muscle : Types of Muscle, Structure and Mechanism of Muscle contraction	1. Ross, Wilson - Anatomy and physiology in Health & illness - 2.. 2. Chatterjee CC - Human physiology
13.	Unit : 5 Nervous system : Brief outline of Nervous System - Structure of Brain, Spinal cord, Nerve fibres	1. Ross, Wilson - Anatomy and physiology in Health & illness 2. Chatterjee CC - Human physiology
14.	Nerve Impulse - Action potential, Membrane potential, Types & Mechanism - Neurotransmitters.	1. Ross, Wilson - Anatomy and physiology in Health & illness - 13th Ed 2. Chatterjee CC - Human physiology

WEEK	PORTION TO BE COVERED	REFERENCE	PLAT FORM
15.	Composition and functions of CSF and Lymph - Structure and functions of eye and ear.	1. Ross, Wilson - Anatomy and physiology in Health & illness 2. Chatterjee CC - Human physiology	Google Meet.

II B.Sc BIOCHEMISTRY

UNEVSIT - ENVIRONMENTAL STUDIES

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLAT FORM
	Unit : 1	Environmental Studies UGC Syllabus by Dr.K.Kumaraswamy Edition - 2004	
1.	Definition of Environment - Scope and importance, Components and Segments of Environment.		Google Meet.
2.	Multidisciplinary nature of Environmental studies.	Environmental studies UGC Syllabus by Dr.K. Kumaraswamy Edition - 2004	Google Meet.
3.	Natural sources : Water, Land, Wind, Energy, Forest and Mineral resources	Environmental Studies UGC Syllabus by Dr. K. Kumaraswamy Edition - 2004	Google Meet.

4.	Ecosystem - Structure and Functions of ecosystem - Food chain & Food web	Environmental Studies UGC Syllabus by Dr. K. Kumaraswamy Edition - 2004
5.	Types of ecosystem - Lake ecosystem, Pond ecosystem, Forest ecosystem, Grass land ecosystem	Environmental Studies UGC Syllabus by Dr. K. Kumaraswamy Edition - 2004
6.	Desert Ecosystem and ocean Ecosystem - Energy flow in Ecosystem - Ecological Succession	Environmental studies UGC Syllabus by Dr. K. Kumaraswamy Edition - 2004
	Unit : 3	
7.	Biodiversity : General terms related to biodiversity, Types	Environmental studies UGC syllabus by Dr. K. Kumaraswamy Edition - 2004
8.	Types of Diversity - India as a mega biodiversity zone.	Environmental studies UGC syllabus by Dr. K. Kumaraswamy Edition - 2004
9.	Threats to biodiversity - Conservation of Bidiversity Values of Biodivertity	Environmental studies UGC syllabus by Dr. K. Kumaraswamy Edition - 2004

III Bsc - BIOCHEMISTRY

UEBCC16 - BIOTECHNOLOGY

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLATFOR
1.	Unit : I Introduction to Biotechnology and its branches - Scope and importance of biotechnology - Biotendlogy in India. Introduction to Genetic Engneering.	1. V. Kumaresan - Biotecnolgy, 3rd Edition. 2. U. Satyanarayan - Biotechnolgy - 3. RC. Dubey - A Textbook of biotechnology 4th edition.	Google Meet
2.	Steps and enzymes Inrowed in Genetic Engneering, Restriction Endonuclease, Nomenclature	1. V. Kumaresan - Biotechnology, 3rd Ed 2. U. Sathyanaran - Biotechnology 3. RC. Dubey - A Textbook of Biotechnology 4th Ed	Google Meet
3.	Reverse Transcriptase, Taq Polymerase, DNA Ligases - Applications of genetic Engineering.	1. V. Kumaresan - Biotechnology, 3rd Ed. 2. R.C Dubey - A textbook of Biotechnology - 4th Ed	Google Meet
4.	Unit : II Gene cloning vectors : plasmids. Cclassification, characteristics. Example: pBR322	1. V. Kumaresan - Biotechnology, 3rd Ed 2. U. Satyanarayan - Biotechnology 3. Rc. Dubey - A Textbook of biotechnol 4th Edition	Google Meet

WEEK	PORTIONS TO BE COVERED	REFERENCE
5.	Shuttle Vectors - Example pJDB219 - Cosmids (Features, Example: Cosmid pLFRS)	1. V. Kumaresan, Biotech 3rd edition. 2. U. Satyanarayana Biotechnology 3. R.C. Dubey - A Textbook of Biotechnolg - 4th edition
6.	Gene cloning in Prokaryotes: methodology of Gene cloning with reference to Insulin gene.	1. V. Kumaresan, Biotechnology, 3rd edition. 2. U. Satyanarayana Biotechnology 3. R.C. Dubey - A Textbook of Biotechnolg -4th edition
	Unit: III	
7.	Plant tissue culture: Basis of Plant cell and tissue culture - A tissue culture laboratory Nutrient media - Composition and preparation - maintenance of Aseptic Environment.	1. U. Satyanarayana Biotechnology. 2. R.C. Dubey - A Textbook of Biotechnology - 4th edition.

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLAT FORM
8.	Methods of plant cell, Tissue and organ culture, Somatic embryogenesis and somoclonal variation. Animal cell culture - Characterstics, Substrates, Culture Media, Somatic cell fusion. Valuble Products from cell culture - Tissue Plasminogen Activator	1. V. Kumaresan - Biotechnology, 3rd etd. 2. U. Sathyanarayan - Biotechnology - 3. R.C Dubey - A Textbook of Biotechnology, 4th Ed	Google Meet.
9.	Gene transfer in plants and animals - Transgenic plants - Herbicide resistance stress tolerance; Transgenic plants as bioreactors - Transgenic animals - Transgenic cattle - The first mammalian clone " "Dolly - Animal Bioreactors.	1. V. Kumaresan - Biotechnology, 3rd Ed 2. U. Sathyanarayan - Biotechnology 3. R.C Dubey - A Textbook of Biotechnology - 4th Ed	Google Meet.
	Unit : IV		
10.	Fermentation Systems - Batch and Continuous Process - Fermentor design - Solid Substrate fermentation	1. V. Kumaresan - Biotechnology - 3rd Ed 2. U. Sathyanarayan - Biotechnology. 3. R.C. Dubey - A Textbook of Biotechnology - 4th Ed	Google Meet.

11.	Components of Medium Criteria used in media formulation - Downstream Processing	1. V. Kumaresan - Biotechnology - 3rd Ed 2. U. Sathyanarayan - Biotechnology 3. R. C Dubey - A Textbook Of Biotechnology
12.	Introduction, Separation Process, example of Recovery Process, Production of wine and SCP	1. V. Kumaresan - Biotechnology - 3rd Ed 2. U. Sathyanarayan - Biotechnology. 3. R. C. Dubey - A Textbook Of Biotechnology
	Unit : V	
13.	Genetically engineered microorganisms (GEMOs) in health care products (Insulin, Cytokines, Interferons, Vaccines)	1. V. Kumaresan - Biotechnology - 3rd Ed 2. U. Sathyanarayan - Biotechnology. 3. R. C. Dubey - A Textbook of Biotechnology.
14.	Vaccines, Risks of releasing Genetically Engineered Organisms.	1. U. Sathyanarayan - Biotechnology 2. Rc. Dubey - A Textbook of Biotechnology

WEEK	PORTIONS TO BE COVERED	REFERENCE	PLAT FORM
15.	Prevention of misuse of biotechnology - Safety handling of biotechnology.	1. V. Kumaresan - Biotechnology - 3rd Ed 2. U. Satyanarayan - Biotechnology. 3. R. C. Dubey - A Textbook of Biotechnology	Google Meet.

WEEKLY PLAN - 2020 - 2021

EVEN SEMESTER

DATE	CLASS HOUR	PORTIONS COMPLETED	METHOD OF TEACHING
04.01.2021	III-Bio 2nd	Introduction to Biotechnology - Definitions, Biotechnology & its branches, Possible areas of Biotechnology.	Google Meet / classroom
	II-Bio 3rd	Introduction, Historical aspects, Branches and physiology.	Google Meet
	II-Bio (EVS) 5th	Definition of Environment Scope and Importance.	Google Meet.
05.01.2021	II-Bio 4th	Scope and Importance of Biotechnology - Medicine, Industry, Environment & Agricultural.	Google Meet / Classroom.