DEPARTMENT OF BIOCHEMISTRY

LESSON PLAN

2019-2020

2018 - 2019 - 2020

Lesson plan for Odd semester

S.No	Name of the Paper	Class
1.	Endocrinology	III year
2.	Nutrition Education	I year SBE
3.	Main practical - III	III Biochemistry
4.	Main practical - II	II Biochemistry

ENDOCRINOLOGY

MONTH	PORTIONS TO BE COVERED
June	Unit - I : Hormones : Definition, Clanification based on mechanism of action. Biosynthesis, circulation in Blood, Target tissue, Outline on the mechanism of hormone action.
July	Unit - I . Receptors. General structure Cell Surface receptors Intracellular receptors. (Feed back mechanism. Unit - II . Hypothalamus and pituitary hormones? Hypothalamic releasing factors. Posterior pituitary hormones . Vasopressin, Oxytocin - secretion - transport and Biological action. Anterior pituitary hormones - Biological action.
August.	Unit - III . Thyroid hormones . Secretion transport and Biological action. Calcium regulating hormones . PTH. Calcitonin - Secretion - Biological action on different organs.

MONTH	PORTIONS TO BE COVERED
September	Unit. IV. Pancreatic Hormones. Cells of islets of Langerhans. Insulin, Glucagon Somalostatin - Secretion, transport and Biological action.
October.	Unit. V Adrenal Hormones. - Secretion. transport and Biological action. Adrenal cortex - Mineralocorticoids. Glucocorticoids. Androgens. Adrenal medulla. Catecholamines. Gonadal Hormones - Androgens Estrogens and Progesterone.

Main Practical - III.

MONTH	PORTIONS TO BE COVERED
July	Estimation of Creatinine by Jaffe's metho Estimation of cholesterol by Zak's metho Estimation of Urea by DAM method. Estimation of Glucose by OT method.
August	Estimation of Protein by Biuret metho Estimation of Uric acid by caraways meth Estimation of Bilirubin by Vandenberg method
September	Estimation of DNA Estimation of RNA. Qualitative analysis of urine sample for their normal and abnormal
October	Determination of SGOT Determination of SGPT.

MONTH	PORTIONS TO BE COVERED
November	Effect of pH on the activity of the enzyme - acid phosphatase Effect of temperature on the activity of the enzyme - acid phosphatase
December	Effect of substrate concentration on the activity of the enzyme. Determination of specific activity
January	Haematological Experiments - Demonstration - Enumeration of RBC & WBC - Estimation of ESR, Hb, Blood group - Packed cell volume - Determination.

Main Practical - II

MONTH	PORTIONS TO BE COVERED
July	Estimation of Iron. Estimation of Copper Estimation of Oxalate Estimation of Lactose
August	Estimation of Hydrogen peroxide Estimation of Calcium Estimation of Glucose
September	Estimation of Carbohydrate by anthrone method. Estimation of Protein by Biuret method Estimation of amino acid by Ninhydrin method
October	Estimation of Ascorbic acid Estimation of Iron Estimation of Inorganic phosphate.

SKILL BASED ELECTIVE - NUTRITION EDUCATION - USBCA...

MONTH	PORTIONS TO BE COVERED
JULY	UNIT-I - Food. Basic food groups - Classification of food based on its functions - nutritional status - Body mass index
AUGUST	UNIT-II. Fruits, Health benefits of Mango, Jackfruits. Banana - Vegetables: Health benefits of Carrots. Cabbage. Ground Vegetables and Green leaf vegetables - Health benefits of millets and Nuts (Almonds & Cashews)
SEPTEMBER	UNIT-III Probiotics: Health benefits of probiotic foods - Health benefits of Meat. chicken. Beef. Lamb and Fish
OCTOBER	UNIT-IV Balanced diet - nutrition in infancy. Childhood. Adolescence, Adulthood and elderly person - Nutrition during pregnancy and lactation.
NOVEMBER	UNIT-V Cooking - Methods of cooking: Baking. Frying. Roasting. Grilling. Steaming and Microwaving - Advantages and Disadvantages. Kitchen hygiene and Tips to maximize nutrient retention during cooking

DATE	CLASS & PORTION COVERED
17:06:'19 to 21:06:'19	III - Biochemistry - Hormones - Definition, classification based on mechanism of action, Biosynthesis, Circulation in Blood.
24:06:'19 to 28:06:19	Target tissues, outline on the mechanism of hormon action, Receptors - general structure, Cell surface Receptors, Intracellular Receptors.

DATE	CLASS & PORTION COVERED
01:07:'19 to 05:07:'19	III Biochemistry Regulations of receptor number, Hypothalamus and pituitary Hormones - Hypothalamic releasing factors.

5/7/19

DATE	CLASS & PORTION COVERED
08:07:'19 to 12:07:'19 12 - SB	III Biochemistry - Posterior pituitary hormones, Vasopressin, oxytocin - Biological functions & role, Trophic hormones (TSH, ACTH, FSH, LH) Main practical - Estimation of creatinine I-SB - Foods, classification of foods
15:07:'19 to 19:07:'19 16 - SB	III Biochemistry - GH, PTH, Disease and disorders related to hormone, amino acid derived hormones. Main practical - Estimation of urea & Health benefits - Mango of Iron

DATE	CLASS & PORTION COVERED
22:07:'19 to 26:07:'19 22 - SB - 4th 24 - SB - 6th	III - Biochemistry - Hypothalamus & pituitary gla disorders, Receptors. Types - Domains. Regulat of receptors number. Animation classes on the above two un Main Practical - Estimation of Glucose by o I. S.B - Jackfruits. Banana - Vegetables, Green leaf Vegetables. Millets & Nuts. II. Main practical - Estimation of Hydrogen pe
29:07:'19 to 02:08:'19	I CA Theory Examination.

DATE	CLASS & PORTION COVERED.
05:08:'19 to 09:08:'19 07 - SB - 4th 9 - SB - 6th	III. BSc Biochemistry. Pancreatic Hormones : Cells of Isle of Langerhans and their functions. Insulin - structure. Receptors. function. Biosynthesis. Practical - (III Biochemistry) - Estimation of cholesterol by ZAK's method Practical - (II Biochemistry) - Estimation of oxalic acid. II. S. B - probiotics, food - Meat, chitin, fat

	COVERED
13:08:'19 to 16:08:'19	II BSc Biochemistry - Secretion and transpo of Glucagon and somatostatin. its Biologi and metabolic functions Practical - (II Biochemistry) - Estimation of Copp I.S.B - Health benefits of lamb, Fish. Types of Fish and Balanced diet.
DATE	CLASS & PORTION COVERED
9-08:'19 to 12:08:'19	II BSc Biochemistry - Secretion and transport of thyroid hormones and its Biological and metabolic functions and role. Practical - Estimation of protein by Biuret method and determination of A/G Ratio. II BSc Biochemistry-Practical - Estimation of Lactose in unknown solution. I.S.B - Nutrition in Infants, childhood and adulthood.
DATE	CLASS & PORTION COVERED
6:08:'19 to :08:'19	III BSc Biochemistry. Introduction of Calcium regulating hormone - synthesis and transp -ort of PTH and its Biological function and role in Bone and kidney Practical - Estimation of DNA by Diphenyl Amine method & Estimation of RNA by orcinol method. I.S.B. Nutrition in Elderly & pregnant

DATE	CLASS & PORTION COVERED
03:09:'19 to 06:09:'19	III. BSc Biochemistry - Calcitonin Secretion and its Biological action and its functions II Biochemistry - practical - Estimation of Lactose in Milk I-SB - Nutrition during Lactation, Method of Cooking.

DATE	CLASS & PORTION COVERED
09:09:'19 to 13:09:'19	III - BSc Biochemistry - Animation Classes and PPT presentations on the topic pancreatic hormones. Insulin. Glucagon and Somatostatin. Practical - Estimation of Bilirubin by Vandenbergh method. I.S.B - Methods of Cooking and Baking

DATE	CLASS & PORTION COVERED.
16:09:'19 to 20:09:'19	III BSc Biochemistry - Animation and PPT Presentation on the topic thyroidal hormones and its Biological functions. Practical - Estimation of uric acid by Caraways method. II BSc Biochemistry - Practical - Estimation of Calcium in Milk. I-SB - Frying and steaming Method of Cooking.

Date	Class & Portions to be Covered.
09.10.19 to 18.10.19	III. BSc. Practical 1) Qualitative analysis of Unknown urine sample. 2) Estimation of SGOT enzyme. II BSc. Practical 1. Estimation of Carbohydrate by anthrone method. 2. Estimation of Aminoacid by Ninhydrin method. III year: Unit. V. Adrenal gland - Cortex and medullary hormones. Nature, Effector cell, Target cell, Biosynthesis, Mechanism of action, Biochemical function. Disorders Gonadal Hormones: Male and Female gonads. Reproductive organs Hormone secreted by Gonads. Androgen, Estrogen and Progesterone. Seminar by students: 1. Disorders anocialed with the levels of hormones. 2. Hormone related / responsible for weight, belly, bone strength. Revision.

DATE	CLASS & PORTIONS COVERED
21.10.19 to 25.10.19.	III year : Revision. I SBE : Questions were given for practise and Revision.

Lesson Plan for Even Semester

NO.	Name of the Paper	Class.
1.	Molecular Biology	III. BSc Biochemistry
2.	Nutrition Education	I. year SBE.
3.	Main practical - III.	III. BSc. Biochemistry
4.	Main practical - II.	II. B.Sc. Biochemistry.

Programme	B.Sc. Biochemistry
Programme code	15
Semester	VI
Course	Molecular Biology.
Course Code	UCBCJ16
Hours	5 hours/week.
Credits	5
Total Hours	90 hours
Max. marks.	40+60
Course Instructor	Dr. G. Abi Beaulah.

Molecular Biology.

Month	Portions to be Covered.
November	Unit. I. Genetics. Mendels Law of Inheritance. Test & Back cross. Mendels Law of Incomplete dominance. Evidences for DNA as genetic material.

MONTH	PORTIONS TO BE COVERED
November.	Griffith experiment, Avery et al experiment. Central dogma of molecular genetics. Prokaryotic and Eukaryotic genome organisation
December.	Unit. II. Prokaryotic replication. Modes of replication. Experimental evidence for DNA semi conservative mode of replication. Enzymes involved in replication. Initiation, Elongation, Termination
January	Unit. III. Prokaryotic transcription RNA polymerase. sigma factors. promoters - Initiation & Elongation and Termination. Post transcriptional processing - rRNA, mRNA & tRNA
February	Unit. IV. Genetic code - General features - Genetic code dictionary Wobble hypothesis. Composition of prokaryotic and Eukaryotic ribosome. Initiation, Elongation, Termination.
March.	Unit-V. Proteomics, Genomics. Gene mapping, Regulation of gene expression in prokaryotes Operon concept. - lac operon DNA repair - Base excision and Nucleotide excision repair Mutation - Definition & classification

2019 - 2020

SEMESTER PLAN (ODD SEM)

III B.Sc BIOCHEMISTRY

UCBCH16 - Intermediary Metabolism

I B.Sc MICROBIOLOGY

UABC19 - Allied Biochemistry

UABCC19 - Allied practical - I

III NON MAJOR ELECTIVE

U61BCAB1T - Diseases and Treatment

I B.Sc BIOCHEMISTRY

UCBCC19 - Main Practical - I

III B.Sc BIOCHEMISTRY

UCBCH16 - Intermediary Metabolism

Monthly plan.

MONTH	PORTIONS TO BE COMPLETED
JUNE	UNIT - I Carbohydrate metabolism: Glycolysis, Role of PDH complex, Citric acid cycle, Amphibolic role of TCA cycle - Glycogenesis, Glycogendysis, Gluconeogenesis - C pathway, Key enzymes and Regulation Energetics of Glycolysis and TCA Cycle - Metabolism of Galactose and Fructose.

MONTH	PORTIONS TO BE COMPLETED
JULY	UNIT- II Uronic acid pathway - pentose phosphate pathway - Glyoxylate pathway - Electron transport Chain, Oxidative phosphorylation, Uncouplers and Inhibitors - High energy compounds.
AUGUST	UNIT- III Detoxification - conjugation, Hydrolysis, Reduction and oxidation - Fate of Dietary proteins - Catabolism of amino acids - Oxidative and non-oxidative deamination. decarboxylation and transamination - Urea cycle.
SEPTEMBER	UNIT- IV Lipid Metabolism: Fate of dietary lipids. Biosynthesis and α, β, ω - Oxidation of Fatty acids - Energetics of β-oxidation. Biosynthesis of Cholesterol - Ketogenesis. TG and phospholipids, Biosynthesis.
OCTOBER	UNIT- V Nucleic acid Metabolism: Fate of Dietary Nucleic acid - Biosynthesis and degradation of purine and pyrimidine nucleotides - Inhibitors of nucleotide biosynthesis - Interrelationship of Carbohydrates, proteins and Fat metabolism

I B.Sc MICROBIOLOGY

UABCA19 - ALLIED I : BIOCHEMISTRY - I

MONTHLY PLAN

MONTH	PORTIONS TO BE COMPLETED
JUNE	UNIT - I Carbohydrates: occurrence, biological importa of Carbohydrates, Structure, Classification and Physical properties of Carbohydrate - Mutarota Chemical properties: Reactions of Glucose - oxidat Reduction and Osazone formation Reactions of Fructose: Oxidation with concentrated Nitric acid. Reduction with Sodium amalgam and Osazone formation occurrence, Structure and properties of Dissaccharides (Maltose, Lactos Sucrose) and Polysaccharides (Starch)
JULY	UNIT-II Amino Acids: Occurrence, biological importance of amino acids, Structure of peptide bond, classification of amino acids based on the structure, polarity of side chain and Nutritional factor physical properties - Amphoteric nature and Isoelectri

MONTH	PORTIONS TO BE COMPLETED
	pH Chemical properties - Reactions involving Carboxyl, Amino and both the groups - Color reactions of amino acids Proteins: Occurrence, biological importance of proteins, Functions, Classifications based on shape. Solubility and composition, Classification based on biological function physical properties Denaturation, Salting in and salting out Structural Organization of proteins - primary, Secondary Calpha helix and beta pleated Sheet), Tertiary and Quaternary Structure
AUGUST	UNIT - III Nucleic acids: Structural Components and Biological Importance of DNA and RNA Double helical Structure of DNA proposed by watson and Crick, Denaturation and Annealing of DNA Structure and role of ribosomal, messenger and transfer RNA Difference between DNA and RNA.
SEPTEMBER	UNIT - IV Lipids occurrence, Biological importance of Lipids Types of Fatty acid - Saturated

MONTH	PORTIONS TO BE COMPLETED
	and unsaturated physical properties of Fats and oils, chemical properties - Reactions involving Double bond, Carboxyl and Hydroxyl groups Classification of lipids - Simple lipids (Fats, oils and Waxes), Compound lipids - Phospholipids: phosphoglycerides (Lecithin, Cephalin and plasmalogen), phosphoinositides (phosphotidyl inositol) and phosphosphingos (Sphingomyelin), Glycolipids: Cerebrosides, Gangliosides Derived lipids - Sterols (Cholest Structure and functions) Iodine number, Acid number, Saponification number, Reichert - meiss number of oils.
OCTOBER	UNIT - V Vitamins : Fat and water Soluble vitamins Sources, RDA, Biochemical functions and Deficiency diseases (A, D, E, K, C, B_1, B_2, B_5, B_6 and B_{12}).

I B.Sc MICROBIOLOGY UABCC19 - ALLIED PRACTICAL

MONTH	PORTIONS TO BE COMPLETED
JULY	Volumetric Analysis:
	Estimation of Glucose by Benedicts method
	Estimation of Glycine by Sorenson's method
	Estimation of Ascorbic acid Using 2,6 Dichlorophenol indophenol
AUGUST	Estimation of Iron Using Potassium permanganate
	Estimation of Nitrite Using Sodium hydroxide
	Estimation of Calcium in Milk
	Qualitative Analysis
	Carbohydrates : Glucose , Fructose
SEPTEMBER	Galactose, Lactose , Maltose
	Sucrose, Starch
	Amino acids : Tyrosine, Tryptophan
	Arginine, Cysteine
OCTOBER	Instrumentation : (Demonstration)
	Chromatography : Column , Paper
	Thin layer
NOVEMBER	Electrophoresis : Vertical and Horizontal
JANUARY	Colorimeter , UV Spectrophotometer , Centrifuge

NON MAJOR ELECTIVE

UGIBCA61T - DISEASES AND TREATMENT

MONTH	PORTIONS TO BE COMPLETED
JUNE	UNIT- I Diseases and its types - Immune System - Types - Innate and Acquired - phagocytosis.
JULY	UNIT- I Contd... Blood: composition, Sickle Cell Anemia, Iron deficiency Anemia, Leucopenia, Hemolysis, Bleedi disorder. Bone disorder: Osteomalacia, Rickets, Joint pain
AUGUST	UNIT: II Asthma: Types, Causes, clinical features and Treatment. Tuberculosis: Causes, clinical features, preventio and Treatment. UNIT - III Diabetes Mellitus: Types, Causes, clinical featur and Treatment.
SEPTEMBER	UNIT- III Contd... Cancer: Types, Causes, clinical features, Diagnosis and Treatment. UNIT- IV : Cardiovascular Diseases: Hypertension, Heart attack Causes, clinical features and Treatment.

	PORTIONS TO BE COMPLETED
OCTOBER	Neurological Diseases: Dementia, Seizures and Coma - Causes, clinical features and Treatment. UNIT-V Skin Diseases: Alopecia Areata, Hirsutism, Psoriasis, Acne Vulgaris, Dandruff - Causes, clinical features and Treatment.

2019 - 2020

ODD SEMESTER

WEEKLY PLAN

DATE	PORTIONS COMPLETED
19.06.19 to 21.06.19	III B.Sc Biochemistry Intermediary Metabolism: Introduction and over view of Carbohydrates. Glycolysis: Definition, Salient features, Reactions, Pathway, Inhibitors, Energetics and Regulation Rapoot leubering cycle - Significance PDH Complex - Significance cycle and Energetics.
24.06.19 to 28.06.19	III B.Sc Biochemistry TCA cycle: Definition, Role of TCA (Amphibolic & Anaplerosis, cycle, Inhibitors, Energetics & Regulations. Glycogen Metabolism Definition, Importance; cycle & regulation. Gluconeogenesis: Definition with importance, pathway, substrates, glucogenic amino acids. I B.Sc Microbiology Introduction about carbohydrates, occurrence, biological structure, classification & physical properties.

DATE	PORTIONS COMPLETED
	III - NON MAJOR ELECTIVE Introduction about Diseases and its types.
01.07.19 to 05.07.19	III B.Sc Biochemistry Propionate and Glycerol. Regulation and Metabolism of Galactose [Significance], Metabolism of Fructose [Significance]. I B.Sc Microbiolgy Chemical properties: Reaction of Glucose - oxidation, Reduction and Osazone formation. Reaction of Fructose: oxidation with Concentrated Nitric acid, Reduction with Sodium amalgam and Osazone formation. III - NON MAJOR ELECTIVE Immune System, Types - Innate and Acquired - phagocytosis. Blood - composition, Sickle cell Anemia.
08.07.19 to 12.07.19	III B.Sc Biochemistry Glyoxylate pathway: cycle with Significance. Uronic acid pathway: Pathway with Significance. High energy Compound: Definition with example: (High & Low energy Compounds) HMP Shunt: Definition, Location, Significance, pathway, Regulation, Deficiencies and Wernicke - Korsakoff Syndrome.

	PORTIONS COMPLETED
	I B.Sc Microbiology Occurrence, Structure and properties of Disaccharides (Maltose, Lactose, Sucrose) and Polysaccharides (Starch). III - NON MAJOR ELECTIVE Iron deficiency Anemia, Leucopenia, Hemolysis, Bleeding disorder (clinical features, causes and treatment.
15.07.19 to 19.07.19	III B.Sc Biochemistry Oxidative phosphorylation: Definition, Location, ATP Synthase (ATPase), Electron transport chain, Mechanism of oxidative phosphorylation & Inhibitors of oxidative phosphorylation - Uncouplers definition with example. I B.Sc Microbiology Nucleic acids: Structural components and Biological Importance of DNA and RNA. Double helical Structure of DNA proposed by watson and Crick, III - NON MAJOR ELECTIVE Bone disorder: Osteomalacia, Rickets, Joint pain (clinical features, Causes and treatment.

DATE	PORTIONS COMPLETED
21.10.2019 to 25.10.2019	III B.Sc Biochemistry Integration of metabolism - Interrelation of Carbohydrate, Protein and lipids, During Starvation and well fed state. - Syllabus Completed. Revision- I B.Sc Microbiology: Sources, RDA, Biochemical functions and Deficiency diseases - Vitamin - B_{12}. - Syllabus Completed. Revision- III B.Sc NON - Major - Elective. Dandruff - Causes, clinical features and treatment. - Syllabus Completed. Revision- Semester portions Completed as per the Syllabus.

2019 - 2020

SEMESTER PLAN

(EVEN SEM)

II B.Sc Biochemistry

Physiology

Main practical - II

III B.Sc Biochemistry

Elective II A: Biotechnology

II B.Sc Biochemistry

physiology

Monthly plan

MONTH	PORTIONS TO BE COMPLETED
NOVEMBER	UNIT - II: Respiratory System: overview of respiratory System,

PORTIONS TO BE COMPLETED

Exchange of Gases; Circulation: Blood Composition and Functions - Types of Blood cells - Morphology and Function - ABO Blood Groups, Blood Coagulation.

DECEMBER

UNIT: II Contd...

Structure of Heart and Blood vessels, Cardiac cycles - Blood pressure (Diastolic, Systolic, Normal Blood pressure) Normal ECG Curve.

UNIT: I

Nutrition: Nutrients - Balanced diet - Nutritional Status - Food groups - Calorific Value of food - RQ, SDA, BMR: Definition and Measurement.

JANUARY

UNIT: III

Digestive System: Structure and function of different Components of digestive system, Digestion, Absorption and Nutritional Significance of Carbohydrates, Lipids, protein - Role of Bile Salts in Digestion and Absorption - Mechanism of HCl and Gastric juice formation in Stomach.

FEBRUARY

UNIT: IV

Excretory System: Structure of Kidney, Nephron - Composition and formation of Urine - Filtration, Active and passive transport of Various Substances and Secretion.

Muscle: Types of Muscle; Structure and Mechanism of Contraction.

MONTH	PORTIONS TO BE COMPLETED
MARCH	UNIT: V Nervous System: Brief outline of nervous system - Structure of Brain, Spinal cord, Nerve Fibres, Synapses, Nerve Impulse - Action potential, Membrane potential, Types and Mechanism - Neurotransmitters - Composition and functions of CSF and Lymph. Structure and function of eye and ear.

III B.Sc Biochemistry

UEBCC16 - Elective II A: Biotechnology

Monthly plan

MONTH	PORTIONS TO BE COMPLETED
NOVEMBER	UNIT-I Introduction to Biotechnology and its Branches - Scope and importance of biotechnology - Biotechnology in India Introduction to Genetic Engineering - Steps and enzymes involved in Genetic Engineering.
DECEMBER	UNIT-I Contd... Restriction endonucleases - Nomenclature, Example: Reverse Transcriptase, Taq polymerase, DNA ligase - Application of genetic Engineering. UNIT-II Gene cloning Vectors: plasmids - Classification, Characteristics, Example: pBR322, Shuttle vectors - example: pJDB219 - cosmid Feature, Example: Cosmid

PORTIONS TO BE COMPLETED

P2FR5). Gene cloning in prokaryotes: methodology of gene cloning with reference to Insulin gene.

JANUARY

UNIT-III

Plant tissue culture: Basis of plant cell and tissue culture - A tissue culture laboratory - Nutrient media composition and preparation. maintenance of Aseptic Environment - Methods of plant cell, Tissue and Organ culture - Somatic embryogenesis and somaclonal Variation - Animal cell culture - characteristics, Substrates, culture Media.

FEBRUARY

UNIT-IV Contd...

Somatic cell fusion - Valuable products from cell culture - Tissue plasminogen Activator - 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.

UNIT-II

Fermentation System - Batch and continuous process - fermentor design - Solid Substrate fermentation - Components of Medium - Criteria used in media formulation - Down Stream processing -

MARCH

UNIT-IV contd...

Introduction, Separation process, Example of recovery process - production of Wine and SCP.

MONTH	PORTIONS TO BE COMPLETED
MARCH	UNIT - V Fermentation System - Batch and Continuous Process. Genetically engineered Microorganism. (GEMOS) in health care products (Insulin, cytokines, Interferons, Vaccines) - Risk of releasing Genetically Engineered Organisms - prevention of misuse of biotechnology - Safety handling of Biotechnology

2019 - 2020

EVEN SEMESTER

WEEKLY PLAN

DATE	PORTIONS COMPLETED
18.11.19 to 22.11.19	III. B.Sc. Biochemistry Introduction to Biotechnology - Definition, old and new biotechnology; History and Biotechnology - A Multidisplinary Growing tree. Scope of Biotechnology Biotechnology in India. Chief functions of DBT, DBT funded research institute in India and Biotechnology Information Centre. II B.Sc Biochemistry Physiology - Introduction, Definition, Survival needs and related body activities. Blood - needs and related body activites. Blood - Definition, functions, composition Hematocrit Value and plasma - Definition and Composition

22/11/19

CLASS : III B.Sc BIOCHEMISTRY SUB CODE : USBCD617

SUB : MEDICAL LABORATORY TECHNOLOGY

MONTH	TOPICS TO BE COVERED
June	UNIT I : Introduction - Medical care, organization of the clinical laboratory - Functional components, Basic needs - Role of medical Laboratory technician, safety aspects and first aid in laboratories
July	UNIT II : Specimen collection : Blood collection by reinpuncture, capillary puncture, finger Stick technique - Equipments and storage of blood collection, anticoagulants - Collection and preservation of urine, sputum, throat swab, stool, CSF specimen
August	UNIT III : Collection and processing of blood for transfusion : Preparation for blood collection Screening, rejection, registration of donor, Blood collection procedure, Transportation, Clinical significance of blood transfusion.
Sept	UNIT IV : Urine analysis : Normal and abnormal constituents of urine. composition, types of urine specimen - Routine examination of urine - Physical examination - Colour, Appearance, odour and specific gravity - Microscopic examination of urine sediment - organized and unorganized elements, blood in urine - Rapid chemical tests of urine. Glucose (Benedicts test), Protein (Heat test for Bence Jones protein), Ketone (Nitroprusside test), Bilirubin (Fouchelé test)

MONTH	TOPICS TO BE COVERED
October	UNIT V Histotechnology and cytotechnology: Introduction to histopathology and cytology. laboratory equipment for cytology and histology: Reagents, microscope, microtome, paraffin oven, tissue floating bath, automated tissue processor and slide warmer. Preparation of tissues for histology, collection of specimen for cytological evaluation and its clinical significance.
	CLASS: UG (III YEARS) SUB : NME: THERAPEUTIC AGENTS SUB CODE: UGBCB 617
June	UNIT - I Drug - Definition - Nature - Routes of administration - Drug absorption - drug distribution - Termination of drugs - Elimination of drugs - Biotransformation.
July	UNIT - II Vaccines - definition - attenuated live vaccine - killed vaccines - immunization schedule for children
August	UNIT - III Antibiotics: Definition, therapeutic application of antibiotics - Penicillin, Erythromycin, Tetracycline, Streptomycin and chloramphenicol - Uses of antiseptics and disinfectants.
Sept	UNIT IV Medical therapies for mouth ulcer, gall stones, urinary stones and intestinal worms.

MONTH	TOPICS TO BE COVERED
October	UNIT V : First aid : Importance rules of first aid First aid box, cuts, abrasions, bleeding fracture, burns, fainting - Poisonous bites - some, common poisons and their antidotes - acid poisoning, alkali poisoning - Poisoning by disinfectants
	CLASS : I B.Sc BIOCHEMISTRY SUB : BIOORGANIC CHEMISTRY SUB CODE : UCBCA19
June July August	UNIT I : Carbohydrates : classification of carbohydrates - Occurence, structure, Properties : reaction with phenyl-hydrazine, acid and alkali - Isomerism. Biological importance of monosaccharides (Glucose and Fructose), Disaccharides (Maltose, Lactose, Sucrose), Polysaccharides (starch, glycogen, cellulose) and mucopoly-saccharides. UNIT II : Amino acids : classification - Physical properties, chemical properties - structure of peptide bond - Proteins - classifications - Physical properties - Primary structure - Secondary structure - Tertiary structure - Quaternary structure Various forces stabilising the structures. Biologically important peptides - Glutathione, Insulin, Vasopressin, Oxytocin UNIT III : Lipids. Occurence, structure, classification and biological importance of lipids and fatty acids Compound lipids - derived lipids - iodine

MONTH	TOPICS TO BE COVERED
September	number, acid number, saponification number, Reichert - Meissel number UNIT IV : Nucleic acids : Structure of purine and pyrimidines - Nucleosides and nucleotides - Structure, forms of DNA (A, B, Z), Properties - Denaturation, Tm, hypo and hyperchromicity cot value - Renaturation, Hybridization - Structure and types of RNA - r RNA, t-RNA m-RNA and Sn RNA - functions of RNA.
October	UNIT V : Vitamins : Fat and water soluble vitamins - Sources RDA, Biochemical functions and deficiency diseases (A, D, E, K, C, B_1, B_2, B_5, B_6 and B_{12}) - Minerals : Iron, calcium, sodium Potassium, iodine and zinc - structure not required.
	CLASS : I B.Sc BIOCHEMISTRY SUB : MAIN PRACTICAL - I SUB CODE : UCBCC19
June - July	Safety measures in the laboratory - I Balance Physical balance, Electronic balance, Analytical balance, weight box, Types of error. Volumetric analysis 1. Estimation of glucose by Benedicts method 2. Estimation of glycine by Sorensons method 8. Estimation of Ascorbic acid using 2, 6 dichlorophenol indophenol 4. Estimation of nitrite using sodium hydroxide 5. Estimation of Iron using potassium

MONTH	TOPICS TO BE COVERED
Aug - Sept	6. Estimation of Copper 7. Estimation of hydrogen peroxide using potassium permanganate 8. Estimation of calcium in milk 9. Estimation of chloride by Mohr's method 10. Acid number of oils 11. Iodine number of oils 12. Saponification number of lipids
Oct - Dec	II Qualitative analysis 1. Carbohydrates : Glucose, Fructose, Galactose, lactose, Maltose, Sucrose, starch 2. Amino acids : Tyrosine, Tryptophan, Arginine, Cysteine, Methionine, Proline
Jan - March	III Cell Biology 1. Mitosis in onion root tip 2. Identification of plant and animal cell 3. Meiosis in flower
	CLASS : I B.Sc MICROBIOLOGY SUB : ALLIED BIOCHEMISTRY PRACTICAL CODE : UABCC19
June, July - Oct	I Volumetric Analysis : 1. Estimation of glucose by Benedict's method 2. Estimation of glycine by Sorenson's method 3. Estimation of Ascorbic acid 4. Estimation of Iron using potassium permanganate 5. Estimation of nitrite using sodium hydroxide 6. Estimation of calcium in milk
Dec - March	II Qualitative analysis : Carbohydrates : Glucose, Fructose, Galactose, Lactose, Maltose, Sucrose, Starch Amino acids : Tyrosine, Tryptophan, Arginine, cysteine III Instrumentation (Demonstration) Chromatography : column, Paper, Thin layer Electrophoresis : Vertical and Horizontal

PAPER CODE	CELL BIOLOGY UCBCB19
Month	Topics to be covered
Nov - Dec	UNIT - I An overall view of cells - origin - evolution of cells - cell theory - cell organization. Types of cell. Structural organization of prokaryotic (E. coli) and Eukaryotic cells (Animal and plant cells) - Comparison between plant cell and animal cell structure. Virus cell structure (T4 Bacteriophage). An overview of molecular organization of cells - Microfilaments (Actin and intermediary filament), Microtubules, Centrioles, Basal bodies, Cilia flagella. TMV (Tobacco mosaic virus)
Jan	UNIT II Components and functions of organelles. Structure and functions of mitochondria. Endoplasmic reticulum - Rough and Smooth endoplasmic reticulum. Ribosomes. Golgi apparatus, Lysosomes, Chloroplast, peroxisomes and glyoxysomes.
feb	UNIT III Nucleus: Nuclear membrane, nucleolus, nuclear pore and annulus - structure of chromosomes - Cell division - mitosis and meiosis I & II
	UNIT IV Cell membrane: Molecular organisation

Month	Topics to be covered
	of animal cell membrane - membrane lipids, proteins and carbohydrates The fluid mosaic model and artificial membranes - mitochondrial and red cell membrane, cell wall : Components and role of cell wall
March	UNIT V Membrane functions : Cell permeability, ion selective channels (Uniport, antiport symport with example) and carriers - Transport processes, diffusion, facilitated diffusion, Active transport process (Na^+K^+ ATPase), ionophores and gap junction and tight junctions cell - cell communication (Belt and spot desmosomes), cell adhesion proteins

SUBJECT : SBE : MEDICAL LABORATORY TECHNOLOGY

CODE : USBCD 19

Month	Topics to be covered
Nov - Dec	UNIT I : Introduction, Code of conduct for laboratory personnel. Medical care organization of the clinical laboratory - functional components. Basic needs Role of medical laboratory technician Safety aspects and first aid in laboratories UNIT II : Specimen collection : Blood collection by vein puncture, capillary puncture, finger stick technique, Equipment storage of blood collection

Month	Topics to be covered
	anticoagulants . Collection and preservation of urine , sputum , throat swab, stool , csf specimen
	UNIT III
Jan	Collection and processing of blood for transfusion . Preparation for blood collection, screening and storage of blood collection procedure Transportation . Clinical significance of blood transfusion . Coombs test
	UNIT IV
feb	Urine analysis : Normal and abnormal constituents of urine . composition types of urine specimen . Routine examination of urine . Physical examination - colour, appearance odour and specific gravity . Microscopic examination of urine sediments . Organized and unorganized elements of urine . Rapid chemical test of urine . Glucose (Benedicts test), Protein (Heat coagulation test) Ketone bodies (Nitroprusside test), Bilirubin (fouchets test)
	UNIT V
March	Histotechnology and cytotechnology introduction to histopathology and cytology , laboratory equipment for cytology and histology : Reagent microscope , microtome , paraffin oven , tissue flotation bath , automated tissue processor

Month	Topics to be to covered
	and Slide warmer - Preparation of tissue for histology, collection of specimen for cytological evaluatio and its clinical significance
	SUBJECT : NME Therapeutic Agents CODE : UCHBCR 17
Nov-Dec	UNIT I : Drug - definition - nature - Routes of administration - Drug absorption - drug distribution - Termination of drugs - Biotransformation
Jan	UNIT II : Vaccines - definition, attenuated vaccine - Killed vaccines - immunisation schedul for children UNIT III : Antibiotics : Definition, therapeutic applications of antibiotics - Penicillin erythromycin, Tetracyclin, streptomycin and chloramphenicol - uses of antiseptic and disinfectants
feb	UNIT IV Medical therapies for mouth ulcer, urinary stones, intestinal worms gall stones
March	UNIT V First aid : Importance rule of first aid box, cut abrasions, bleeding fractures, burns, fainting, poisonous bites - some common poisons and their antidotes, acid poisoning, alkali poisoning, poisoning by disinfectants

SBE : Medical Laboratory Technology - USBCD19

WEEK	TOPICS TO BE COVERED	REFERENCE
1	Introduction - Medical care, organization of the clinical lab,	1. Kanai L Mukhe - Medical Labor Technology, Vol- Tata McGraw H Publishing Ltd,
2	Functional components Basic needs - Role of medical Laboratory technician, safety aspects and first aid in the laboratory	1. Kanai L Mukhe - Medical Labora Technology, Vol- Tata Mc Graw H Publishing Ltd,
3	Specimen collection : Blood collection by Vein puncture technique - Equipments and storage	1. Kanai L Mukhe - Medical Labora Technology, Vol- Tata Mc Graw Hill Publishing L 2000 2. V.H Talib - A hand of Medical Labo- ratory Technolog Reprint 2004, CBS Publishers, 2004
4	Anticoagulants	1. Kanai L Mukher- Jee - Medical Laboratory Techn- ology, Vol-I Tata Mc Graw Hill Publishing Ltd, 2000
5	Collection and preservation of urine,	1. Kanai L Mukh -erjee - 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 Mc Graw 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 Mc Graw 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 Mukherjee - Medical Laboratory Technology, Vol-II Tata McGraw Hill 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 Laboratory Technology - Reprint 2004, CBS Publisher, 2004
14	Histopathology, - Introduction cytology, Laboratory equipment for cytology and histology : Reagents Microscope, microtome	Kanai L Mukherjee - Medical Laboratory Technology, Vol-II Tata McGraw Hill Publishing Ltd, 200
15.	Paraffin oven, tissue flotating bath, automated tissue processor and slide warmer - Preparation of tissues for histology collection of specimen for cytological evaluation and its clinical significance	

CLASS : I B.Sc Microbiology

SUBJECT : Allied Biochemistry-I

CODE : 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. Atherosclerosis : 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, 200

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 energetics, TCA cycle - energetics - Electron transport chain	Lehninger, David Nelson and M Cha 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 Cha 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 - Fundamen of Biochemistry, New Central Boo Agency Ltd, 9th Ed, 2008
10	Insulin Biological functions and disorders, Thyroid hormones - Biological functions and disorders	A.C Deb - Fundamentals Biochemistry, New Central Boo 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 Jain Nithin Jain - Fundamentals of Biochemistry S chand and Company, 2008
13	Iron - Source, RDA, role and deficiency diseases Potassium - Source, RDA role and deficiency diseases	Satyanarayana U. Textbook of Biochemist -3rd Ed, Books and Allied Private Ltd, 2008
14	Iodine - Source, RDA, role and deficiency diseases Sodium - Source, RDA, role and deficiency disease, Copper - Source	Deb AC - Fundamental of Biochemistry - New Central Book Agency Ltd, 9th Edition, 2008.
15	Copper Source, RDA, role of copper and deficiency diseases	Satyanaryana U. Textbook 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 differed method, criteria of purity - Specific activity	1. Trevor Palmer - Enzymes - Biochemistry, Biotechnology and clinical chemistry - Albion, Reprint Ed 4th Reprint Edition, 2004 2. Enzymes by Boyer 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.	8. Trevor Palmer - Enzymes 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. Enzymes 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 of oxidative and non-	T.D.H Bugg. Introduction to Enzymes & coenzyme 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 : Biochem 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 unrolved reaction.	T.P.H Bugg - Introdu 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	

2019-2020

LESSON PLAN FOR ODD SEMESTER

PAPER	CLASS
Immunology	III-B.Sc. Biochemistry
Main Practical - III	III-B.Sc. Biochemistry
SBE: Diseases and Diet Therapy	III-B.Sc. Biochemistry
Main Practical - I	I-B.Sc. Biochemistry
SBE: Health Care for Women	II-years

III-B.Sc-Biochemistry: Elective IA: Immunology

Month	Portions to be Covered
June	Unit-I: Introduction - Primary and Secondary lymphoid organs - Thymus, Bonemarrow, Lymph node and Spleen, Cells involved in immune system: Morphology, Secretion and functions. Types of immunity - Innate and Acquired immunity.
July	Unit-II: Antigens: Essential features. Epitopes, Haptens, Adjuvants. MHC antigens (elementary knowledge). Antibodies: Types, Structure, Properties and biological functions - clonal Selection theory - production and applications of monoclonal antibodies.

Month	Portions to be Covered
August	Unit - III : Antigen - antibody interactions : Precipitation agglutination. Complement fixation, lysis and opsonization - Immuno techniques : RIA, ELISA. fluorescent antibody technique. immuno blotting technique - Immuno electrophoresis.
September	Unit - IV : Complement - Salient features - Classical and Alternative pathway - Humoral immunity, Cell mediated immunity. Autoimmunity - pathogenesis of Grave's disease, Myasthenia gravis, Rheumatoid arthritis, SLE and Multiple Sclerosis.
October	Unit - V : Transplantation immunology : Types of grafts. mechanism of allograft rejection - Hypersensitivity : Types (I, II, III and IV) - mechanism.

III - B.Sc. Biochemistry : SBE : Diseases and Diet Therapy

Month	Portions to be covered
June	Unit : I : Food - Role of food, food pyramid. classification of food based on chemical nature and biological functions. Water - Sources of water. functions and water balance. Abnormalities associated with water - Dehydration and over hydration -

Month	Portions to be Covered
	Causes, Symptoms, preventive measures and treatments. Dietary fibres - Sources, types of dietary fibres. Health benefits of dietary fibres, Oats.
July	Unit-II: Sources and health effects of free radicals Antioxidants - Definition, Sources, types of antioxidants. Antioxidant rich foods - fruits, Vegetables, Spices - Cinnamon, Cardamon, Clove, Cumin, pepper, Ginger. Beverages - Green tea, Tea and Coffee.
August	Unit-III: Diseases due to protein-Calorie malnutrition and under nutrition (Kwashiorkor and Marasmus), Vitamins and Minerals (Calcium, Sodium, Iron, Iodine)- Sources, RDA, functions & deficiency diseases. Eating disorders - Anorexia nervosa, Bulimia nervosa, Binge eating disorder.
September	Unit-IV: Clinical Dietetics - Hypertension, Renal stones, Intestinal Worms, Mouth ulcer, polycystic ovaries, Fibroids, Cancer - ovarian, cervical & Breast Cancer.
October	Unit-V: Health - Definition, importance of women's health. Healthy tips for women, Anemia - Types (Iron deficiency anemia, Megaloblastic anemia, Sickle cell anemia) - causes, Symptoms, diagnosis and treatment. Menstrual cycle and puberty in females.

Month	Portions to be Covered.
June to July	Unit-I: Health - Definition - Importance of women's health. Healthy tips for women. Anemia: Ty Iron deficiency anemia. Megaloblastic anemia Causes. Symptoms. Diagnosis and Treatment.
August	Unit-II: Physiological anatomy of female reprod system. Hormones related with females - Est and progesterone. Puberty. Menopause.
	Unit-III: Ovarian Cancer, Cervical Cancer, polycyst ovaries, fibroids - Types. Causes. Symptoms Diagnosis and Treatment.
September	Unit-IV: Depression, Blood pressure, osteoporo Female infertility, Amenorrhea - Causes. Symp Diagnosis. Treatment.
October	Unit-V: Urinary infection, role of thyroid hormones in women. blood group system, Rh factor. Erythroblastosis foetalis.

III. B.Sc. Biochemistry - Main Practical - III

Month	Practicals to be covered
	Colorimetric Estimation
June - July	Estimation of Glucose by Orthotoluidine Method
	Estimation of Urea by Diacetyl Monoxime Method
	Estimation of Creatinine by Jaffe's Method
	Estimation of Bilirubin by Vandenbergh method
	Estimation of Uric acid by Caraway's method
August	Estimation of protein by Biuret method and determination of A/G ratio by Reinhold method.
	Estimation of DNA by Diphenyl amine method
	Estimation of RNA by Orcinol method
	Enzyme Analysis
September	Determination of SGOT
	Determination of SGPT
	Effect of P^H on the activity of the enzymes - Acid phosphatase
October	Effect of Temperature on the activity of enzymes - Acid Phosphatase
November	Effect of Substrate Concentration on the activity of enzyme - Acid phosphatase
	Determination of Specific activity of the enzyme - Acid Phosphatase.
December	Qualitative Analysis of urine for normal and abnormal Constituents.

Month	Practicals to be Covered
December	Hematological Experiments (Demonstration) Enumeration of RBC and WBC Estimation of Erythrocyte Sedimentation Rate Determination of Hemoglobin Blood grouping Packed Cell Volume

2019-2020

LESSON PLAN FOR EVEN SEMESTER

PAPER	CLASS
Clinical Biochemistry	III-B.Sc. Biochemistry
Main Practical - III	III-B.Sc. Biochemistry
SBE: Diseases & Diet Therapy	III-B.Sc. Biochemistry
SBE: Health Care for Women	II-years
Main Practical - I	I-B.Sc. Biochemistry

III-B.Sc. Biochemistry : Clinical Biochemistry

MONTH	PORTIONS TO BE COVERED
November	UNIT I: Diseases related to carbohydrate metabolism - Hypo and Hyperglycemia, Renal threshold value and TMG, Diabetes Mellitus Types, etiology, clinical features, Complication Diabetic Ketoacidosis - significance of fasting and post parandial blood glucose - Glucose Tolerance Test - Glycosylated Hb - Galactosemia, Fructosuria, Glycogen Storage Diseases. UNIT: Disease related to Lipid: Lipoprotein Types, functions, Atherosclerosis, Ischemic Heart disease (IHD), Obesity, factors affecting Blood Cholesterol level,

MONTH	PORTIONS TO BE COVERED
December	Hypercholesterolemia: elementary details of Hypo and Hyper lipoproteinemia, fatty liver Cirrhosis. Inborn errors of aminoacid metabolism. Phenylketonuria, Alkaptonuria, Cystinuria, Hemophilia, Albinism.
January	UNIT III: Liver function Test - Metabolism of Bilirubin - Jaundice - Types - Liver function test based on abnormalities of pigment metabolism Vandenbergh reaction and urine bilirubin - Galactose Tolerance Test - BSP test Prothrombin time - Enzymes of Diagnostic importance AST, ALP, CPK, LDH.
February	UNIT IV: Renal function test - Glomerulonephr Nephrotic syndrome - clearance - Definition types - Renal function test based on glomeru filteration (Urea and Creatinine clearanc Renal plasma flow (PAH test), Tubular function - Phenol sulphathalein test - Gastric function test - Collection of gastric contents Examination of gastric residum - FTM, Stimu test - Alcohol, caffeine, Histamine.
March	UNIT V: Diagnostic enzymes and tumour markers - SGOT, SGPT, Alkaline phosphatase Amylase, Streptokinase - cancer: etiology morphological changes in tumour cells. Tumour markers - AFP, CEA and HCG

III. B.Sc. Biochemistry - 3BE : Diseases and Diet Therapy

MONTH	PORTIONS TO BE COVERED
November	UNIT-I : Food. Role of food. food Pyramid. Classification of food based on Chemical nature and biological functions. Water - Source of water functions and water balance. Abnormalities of water - Dehydration and overhydration - Causes, symptoms, preventive measures and Treatment. Dietary fibres. Sources, Types of dietary fibres. Health benefits of dietary fibres, oats.
December	UNIT-II : Sources and Health effects of free radicals. Antioxidants. Definition, Sources, Types of antioxidants. Antioxidant rich foods - fruits, Vegetables, Spices - Cinnamon, Cardomom, Clove, Cumin, pepper, Ginger. Beverages - Green tea, tea, coffee.
January	UNIT - III : Diseases due to protein - Calorie malnutrition and under nutrition (Kwashiorkar and Marasmus) Vitamins and minerals (Calcium, Sodium, Iron, Iodine) - Sources, RDA, function and deficiency disease. Eating disorder Anorexia nervosa, Bulimia nervosa, Binge eating disorder.
February	UNIT - IV : Clinical dietetics - Hypertension. Renal stones, intestinal worms, Mouth ulcer polycystic ovaries, fibroids, cancer - Ovarian, Cervical and Breast cancer.

MONTH	PORTIONS TO BE COVERED
March	UNIT-V: Health - Definition. importance of women health, healthy tips for women. Anemia. Types (Iron deficiency anemia, Megaloblastic anemia Sickle cell anemia) causes, Symptoms, diagnosis and treatment. Menstrual cycle, puberty in females.

SBE: HEALTH CARE FOR WOMEN

MONTH	PORTIONS TO BE COVERED
November	UNIT-I: Health. Definition. Importance of womens health. Healthy tips for women. Anemia - Types - Iron deficiency anemia, Megaloblastic anemia - causes, Symptoms, Diagnosis and Treatment.
December	UNIT-II: Physiological anatomy of female reproductive system. Hormones related with females - Estrogen & progesterone. puberty. Menopause.
January	UNIT-III: Ovarian cancer, cervical cancer, polycystic ovaries. fibroids - Types. causes, Symptoms. Diagnosis and Treatment.
February	UNIT-IV: Depression, Blood pressure, Osteoporosis. Female infertility. Amenorrhea causes, Symptoms, Diagnosis. Treatment.

MONTH	PORTIONS TO BE COVERED
March	UNIT - V : Urinary infection, Role of thyroid hormone in women. Blood group system. Rh factor, Erythroblastosis foetalis.

2019 - 2020

Lesson plan for even semester

PAPER	CLASS
1. Pharmacology	III B.Sc Biochemistry
2. Allied II : Biochemistry III	I B.Sc Microbiology
3. NME : Diseases & Treatment	III UG
4. Allied Practicals	I B.Sc Microbiology

III B.Sc Biochemistry - Pharmacology

Month	Portions to be covered
	UNIT I :
	Introduction : Sources, Dosage forms. Route of administration, classification - absorbtion of drugs to plasma proteins Receptor - Types, Binding forces in Drug-receptor interaction and consequences of Drug receptor interaction.
	UNIT II :
	Xenobiotics - Phase I - mechanism of oxidation, reduction, hydrolysis and phase II - conjugation - Structure and uses of oral hypoglycemic drugs - classes, Parenteral
	UNIT III :
	Antibiotics : Structure and therapeutic uses of penicillin, Streptomycin, Tetracycline chloramphenicol and Erythromycin ; Antiseptics and Disinfectants - structure and uses of i) Phenols and related compounds - a) Alkyl Substituted Phenols : Cresol, Thymol b) Chlorinated Phenols : Chloroxylenol

nth

Portions to be covered

ii) Halogen compounds - chloramine iii) Organic mercurial - Thiomersal iv) formaldehyde and its derivative v) Nitrofuran derivative - Nitro furazone

UNIT IV :

Cardiovascular drugs - Structure and action of cardiac glycosides - Digoxin and Digitoxin ; Antiarrhythmic drugs - Structures and uses of propanolol and procainamide ; Antihypertensive Agents - i) Drugs acting centrally - Example : clonidine, alpha methyl dopa ii) Ganglion blockers -

UNIT V :

Analgesics - Morphine, pethidine

Example : pentolium Tartrate iii) Vasodilators - Example : Tolazine iv) β Blockers - Ex : Phenoxybenzamine - Hypotensive agents.

UNIT V :

Analgesics - Morphine, pethidine, Aspirin, Salicin, paracetomol and phenacetin. Analgin and Indomethacin ; Anaesthetic - chloroform, Nitrous oxide, Trichloethylene, Benzocaine, procaine, Lignocaine ; cytotoxic agents - chlorambucil.

Refere Books :

1. Satoskar. RS, Bhandarkar SD and Ainapure SS - Pharmacology and pharmacotherapeutics - 24th edition - popular prakashan, 1995
2. William Foye - Principles of Medicinal chemistry - 5th Ed - 2002
3. Patrick J Graham - An introduction to Medicinal chemistry - 6th Ed - oxford university press, 2013
4. Graham, Smith DG and Areson JK - Textbook of Clinical Pharmacology and Drug therapy - 3rd Ed -

Month | Portions to be covered

Oxford University press, 2002

5. West SE, Todd RW, Mason SR and Bruggin TJ - Textbook of Biochemistry - 4th Ed - Oxford university press, 1974

I Microbiology - Allied II : Biochemistry I

Month | Portions to be covered

UNIT I :

Enzymes : General characterishcs and IUB classification of Enzymes, Enzyme units (IU and Katal), Active site, Lock and key and induced fit hypothesis, Effect of temp, pH and Substrate concentration of enzyme activity. (Michaelis - Menten equation), Enzyme inhibition - competitive, non competitive and uncompetitive inhibition (Kinetics not required). Industrial and medical applications of enzymes.

UNIT II :

Clinical biochemistry - Diabetes mellitus, Types, causes and symptoms - Atherosclerosis Stages, Risks and consequences, Obesity - Gout - protein calorie malnutrition - Marasmus and Kwashiorkor.

UNIT III :

Intermediary metabolism : Pathway and Energetics (Regulation not required) - Glycolysis, TCA cycle, B-oxidation of fatty acids, Urea cycle