DEPARTMENT OF BIOCHEMISTRY

LESSON PLAN

2018-2019

2018 - 2019

Lesson plan for Odd semester.

Papers to be handled.

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

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. vasopresin, oxytocin - secretion - transport and Biological action. Anterior pituitary hormones. Biological action.
August	Unit. III. Thyroid hormones. Secretion transport and Biological actions. 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, Somatostatin. Secretion, transport, and biological actions.
October	Unit. V Adrenal hormones. Secretion, transport and Biological action. Adrenal cortex mineralocortico Glucocorticoids. Androgens. Adrenal medu Catecholamines. Gonadal hormones Androgens, Estrogens, Progesterone.

Main Practical - III.

MONTH	PRACTICALS 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 metho
August.	Estimation of protein by Biuret meth
	Estimation of Uricacid by caraways met
	Estimation of Bilirubin by Vandenbergh method
September	Estimation of DNA.
	Estimation of RNA.
	Qualitative analysis of Urine sample - Normal and abnormal Constituents.
October.	Determination of SGOT
	Determination of SGPT.

MONTH	PRACTICALS 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	PRACTICALS 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 by Fiske- Subbarow method. Estimation of Fructose by Resorcinol method

MONTH	PRACTICALS TO BE COVERED
December.	Preparation of Buffer. Determination of pH.
January.	Chromatography Electrophoresis.

SBE Nutrition Education.

MONTH	PORTIONS TO BE COVERED
July.	Unit. I. Food. Nutrients. Nutrient status. Clarification of Food. Dietary Fibre Antioxidants.
August.	Unit. II Nutrional value and health benefits of Fruits.
September	Unit. III Nutrional value and health benefits of Vegetables.
October	Unit. IV Nutrional value and health benefits of Spices and beverages.
November.	Unit. V Water. Water balance Eating disorders.

J. Shaik
29/6/15

2018-2019

Lesson plan for Even Semester

S.No	Name of the paper	Class
1.	Molecular Biology	III BSc. Biochemistry
2.	Nutrition Education	I year BBE.
3.	Main practical - III	III BSc. Biochemistry
4.	Main practical - II	II BSc Biochemistry.

Molecular Biology.

MONTH	PORTIONS TO BE COVERED
November	Unit. I. Evidences for DNA as genetic material. Griffith experiment. Avery et al and Hershey-Chase experiment. Central dogma of molecular genetics.
December	Prokaryotic and Eukaryotic genome organisation. Genetics: Mendels law. Repetitive DNA. Unit. II. Prokaryotic replication. Models of replication. Experimental evidence for semiconservative replication. Enzymes involved in replication. Prokaryotic DNA polymerase Topoisomerases, Helicases, DNA ligase, Proces of prokaryotic replication: Initiation, Elongation and Termination of replication. Inhibitors of replication.

MONTH	PORTIONS TO BE COVERED
January	Unit. III. Prokaryotic transcription RNA polymerase, Sigma factor Promoters, Procen of transcription Initiation, Elongation, Terminat... Post transcription procening rRNA, tRNA and mRNA procen...
February.	Unit. IV Translation: Genetic co... General features Genetic code dictionary. Wobble hypothesis Composition of prokaryotic and Eukaryotic ribosome. Procen of prokaryotic translation - Initiation Elongation and Termination. Post translational modification
March.	Unit. V. Proteomics, Genomics Gene mapping, Regulation of gene exprenion in prokaryotes. Operon concepts - lac operon. DNA repair - Base excision and Nucleotide excision repair. Mutation - Definition & classificati...

Nutrition Education - Same as previous semester

Main practical II & III Odd & even semes...

2018 – 2019

SEMESTER PLAN (ODD SEM)

III B.Sc BIOCHEMISTRY:

UCBCH16 – Intermediary Metabolism.

II B.Sc BIOCHEMISTRY:

UCBCD16 – Biochemical Techniques

UCBCF16 – Main Practical – II

III B.Sc MATHEMATICS:

UVEDA13 – Value Education.

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, Glycogenolysis, Gluconeogenesis – (Pathway Key enzymes and Regulation). Energetics of Glycolysis and TCA cycle.
JULY	UNIT: I contd... Metabolism of Galactose and Fructose. UNIT: II Uronic acid pathway – Pentose phosphate pathway – Glyoxylate pathway – Electron transport chain, oxidative phosphorylation. Uncouplers and Inhibitors – High energy compounds.

MONTH	PORTIONS TO BE COMPLETED
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.

II B Sc BIOCHEMISTRY
UCBCD16 – Biochemical Techniques
MONTHLY PLAN

MONTH	PORTIONS TO BE COMPLETED
JUNE	UNIT: II Chromatography: Principle, instrumentation, operation and applications of Paper-Chromatography, TLC, Affinity chromatography Ion exchange chromatography, Molecular Sieve chromatography.

JULY

UNIT: II contd...

Gas Chromatography and HPLC.

UNIT: I

Radio isotopic Techniques: Radioisotopes - Stable and unstable, Units of Radioactivity, Types of Radioactivity, Detection and measurement of radioactivity (Methods based on Gas ionization, Autoradiography and excitation) Applications of radioisotopes in biological Science (Isotope dilution technique, metabolic Studies Radio dating) - Radiation hazards & Safetyaspects.

AUGUST

UNIT: IV

Spectroscopy: Fundamental principles of spectroscopy - Basic laws of absorption - Beer - lambeits law - principle, instrumentation, operation and application of UV - VIS - IR Spectrophotometry, Fluorimetry, AAS, FES.

SEPTEMBER

UNIT: I

Expression of the concentration of solutes in Solution Normality, Molarity, Molality, Mass concentration - Osmole - Acids, Bases, Buffers and pH (Definition and examples) - Henderson equation - Osmosis - Isotonic, Hypo and Hypertonic, Osmotic pressure (Vant Hoff's law), Surface tension & viscosity: Biological importance - Instrumentation, operation and application of Electrodes - pH electrode (Hydrogen and Glass) and Clark oxygen Electrode. Colloids: Definition and types.

OCTOBER

UNIT: III

Electrophoresis: Principle, instrumentation, operation and applications of Paper, agarose, starch and SDS - PAGE - Isoelectric focusing, capillary electrophoresis. Centrifugation: Svedberg unit - Basic principle of Centrifugation - Types of centrifuges & Rotors - cell Fractionation. Instrumentations and applications of [illegible] and Analytical centrifuges.

MONTH	PRACTICALS TO BE COMPLETED
JULY	Volumetric Analysis: Estimation of Iron Estimation of oxalate Estimation of Hydrogen peroxide Estimation of Lactose by Benedict method
AUGUST	Estimation of copper Estimation of calcium in milk Colorimetric Estimation: Estimation of protein by Biuret method
SEPTEMBER	Estimation of carbohydrate by Anthrone method Estimation of Iron Estimation of Inorganic phosphorous by Fiske Subbarow method.
OCTOBER	Estimation of Fructose by Resorcinol method Estimation of Amino acids by Ninhydrin method.
NOVEMBER	Estimation of Ascorbic acid
DECEMBER	Preparation: Phosphate Buffer citrate Buffer sols and colloids. Biochemical Techniques: (Demonstration) Paper chromatography Determination of pH of saliva / Urine / Blood
JANUARY	Agarose gel Electrophoresis. SDS - PAGE Electrophoresis.

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29/6/16

	PORTIONS COMPLETED
	IsoElectric Focusing: principle, Technique (Vertical column IEF and Horizontal gel IEF), Detection and Application. Capillary Electrophoresis (CE): Principle, instrumentation, Technique, Detection and application. - Revision - Semester portions completed as per the syllabus.

2018 - 2019
SEMESTER PLAN
(EVEN SEM)

II B.Sc Biochemistry
UCBCE16 - Physiology
UCBCF16 - Main Practical - II

III B.Sc Biochemistry
UEBCC16 - Elective II A: Biotechnology

III B.Sc Mathematics:
UVEDA15 - Value Education.

II B.Sc Biochemistry
UCBCE16 - Physiology
Monthly Plan

MONTH	PORTIONS TO BE COMPLETED
NOVEMBER	UNIT: II Circulation: Blood - composition and Functions. Types of Blood cells - Morphology and Function - ABO Blood groups, Blood coagulation - Structure of Heart and Blood vessels.

COMPLETED

DECEMBER

UNIT: II contd...

Cardiac cycles - Blood pressure (Dias Systolic, Normal Blood pressure) Norm 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 functi of different components of digestive System, Digestion, Absorption and Nutritiona Significance of carbohydrates, lipids and Proteins - 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.

MARCH

UNIT: V

Nervous System: Brief outline of Nervous System - structure of Brain, Spinal cord, Nerve fibres, Synapses - Nerve Impulse - Action potential, membran potential, Types and mechanism - Neuro transmitters - composition and function of CSF and Lymph. Structure and functions 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 Engeneering - steps and enzymes involved in Genetic Engeneering: Restriction endonucleases - Nomenclature, Example.
DECEMBER	UNIT: I contd... Reverse Transcriptase, Taq Polymerase, DNA ligases - Applications of genetic engeneering. UNIT: II Gene cloning vectors: Plasmids - classification, characteristics, Example: pBR322, Shuttle vectors - example: pJDB219 - cosmids (Feature, Example: Cosmid pLFR5). 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 somoclonal variation - Animal cell culture -

JANUARY	UNIT: III contd... Characteristics, Substrates, culture medi Somatic cell fusion – valuable products fr cell culture – Tissue Plasminogen Activa Gene transfer in Plants and Animals –
FEBRUARY	UNIT: III contd... Transgenic plants – Herbicide Resistan Stress tolerance; Transgenic plants as bioreactors – Transgenic Animals – Transg Cattle – The first mammalian clone – D Animal Bioreactors. UNIT: IV Fermentation System – Batch and continuo Process – Fermentor design – solid Substra fermentation – components of Medium – Criteria used in media formulation – Downstream processing – Introduction, Separation process, example of recovery process – Production of Wine and SCP.
MARCH	UNIT: V Genetically engineered microorganism (GEMOs) in health care products (Insuli cytokines, Interferons, Vaccines) – Risks releasing Genetically Engineered organi Prevention of misuse of biotechnology – Safety handling of biotechnology.

20/4/18

WORK PLAN FOR THE YEAR - 2018

CLASS : I B.Sc BIOCHEMISTRY

SUBJECT : BIO ORGANIC CHEMISTRY

SUB CODE : UCBCA16

SEMESTER : I

MONTH	TOPICS TO BE COVERED
June - July	Unit - I Carbohydrates : Occurence, structure, classification of carbohydrates, chemical and physical properties of glucose (Hydroxyl & carboxyl reactions), Fructose - Isomerism (Enantiomers, Epimer - Isomerism) Anomers functional group isomerism - Mutarotation - Glucose ; Fischer's open chain and Haworth's ring formulae (Elucidation and conformational formula not required). Occurence, structure, properties and biological importance of disaccharides (Maltose, lactose, sucrose) - Polysaccharides : Occurence structure and biological importance of polysaccharides (starch, Glycogen, cellulose) - Mucopolysaccharides - Occurence, structure and biological importance. Unit - II Amino acids : Occurence, structure of naturally occuring and non-protein amino acids : classification of amino acids based on structure, number of amino & carboxyl groups, polarity of side chain, based on nutrition. Physical properties - Amphoteric nature and isoelectric pH, chemical properties - Reactions due to amino and carboxyl groups. structure of peptide bond Proteins - Occurence, classification based on shape, solubility and composition, biological function. Physical properties :

MONTH	TOPICS TO BE COVERED
	Denaturation, salting in and salting out. Primary structure - Primary sequencing of amino acids - End group analysis - N-terminal (Edmans method, Dansyl chloride method) and C-terminal analysis (Hydrazinolysis, carboxy peptidase method). Secondary structure - α-helix, β-pleated sheet - Tertiary structure. Quaternary structure - Various forces stabilizing the structure - Biologically important peptides - Glutathione, Insulin, Vasopressin
	Unit - III
August	Lipids: Occurence, structure, classification and biologically importance of lipids and fatty acids. Saturated and unsaturated Compound lipids: Phospholipids, phosphoglycerides (Lecithin, cephalin, Plasmalogen) Phosphoinositides (Phosphatidyl inositol) and phosphosphingosides (Sphingomyelin), Glycolipids - cerebrosides, gangliosides, Derived lipids - sterols (Cholesterol, ergosterol - structure and function) Characteristic of lipids - Iodine number, acid number, saponification number, Reichet-Meissel number.
	Unit IV
Sept	Nucleic acids: Structure of purine and pyrimidine - Nucleosides and nucleotides Structure, types, double stranded DNA and forms (A, B, Z) of DNA. Properties

MONTH	TOPICS TO BE COVERED
	denaturation, Tm, hypo & hyperchromicity cot value. Renaturation, hybridization structure and types of RNA - t-RNA, r-RNA, m-RNA and S_nRNA. Functions of RNA.
	Unit - V
October	Vitamins: Water and fat soluble vitamins sources, RDA. Biochemical functions and deficiency diseases (A, D, E, K, C, B_1, B_2, B_6 and B_{12}) - Minerals - Iron, calcium, sodium, potassium, iodine and zinc - structure not required.

CLASS : III B.Sc BIOCHEMISTRY

SUBJECT : SBE : MEDICAL LABORATORY TECHNOLOGY

SUB CODE : UGBCB517 USBCD16

	Unit - I
June	Introduction: Medical care, organisation of clinical laboratory - functional components Basic needs - Role of medical laboratory technician. Safety aspects and first aid in laboratories
	Unit II
July	Specimen collection: Blood collection by vein puncture, capillary puncture, finger stick technique - Equipments and storage of blood collection, anticoagulants. Collection and prevention of urine, sputum, throat swab, stool, CSF specimen
	Unit - III
August	Collection and Processing of blood for transfusion. Preparation of blood collection screening, rejection, registration of donors

MONTH	TOPICS TO BE COVERED
	blood collection procedure, transportat clinical significance of blood transfusion
	Unit - IV
	Urine analysis : Normal and abnormal constituents of urine, composition - Types of urine specimen, route examin of urine - Physical examination of uri - colour, specific gravity - appearance of urine - Microscopic examination of
September	urinary sediments - Organized and unorganized elements. Blood in urine. Rapid chemical test of urine - Glucose (Benedicts test), Protein test (Heat test fo Bence Jone Protein), ketone bodies (Nitroprusside test), Bilirubin (Fouchets te
	Unit - V
	Histological techniques : Introduction to histopathological techniques, cytology, laboratory equipment for cytology &
October	histology, Reagents, microscopes, microte paraffin oven, tissue floatation bath, automated tissue processor. Preparatio of tissues for histology. Collection of specimen for cytology and its clinical applications.

CLASS : III UG
SUBJECT NME : THERAPEUTIC AGENTS
SUB CODE : UGBCB517 , SEMESTER : V

MONTH	TOPICS TO BE COVERED
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 vaccines - Killed vaccines - immunization schedule for children
August	Unit - III Antibiotics : Definition , therapeutic application of antibiotics – Penicillin , Erythromycin , Tetracyclin , Streptomycin and chloramphenicol - Uses of antiseptics and disinfectants
September	Unit - IV Medical therapies for mouth ulcer , gall stones , urinary stones and intestinal worms .
October	Unit - V First aid : Important 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 SEMESTER : I & II

SUBJECT : MAIN PRACTICAL-I SUB CODE : UCBCC

July - August

Volumetric Analysis

1. Estimation of glucose by Benedict's method
2. Estimation of glycine
3. Estimation of Ascorbic acid
4. Estimation of Nitrite
5. Estimation of chloride by Mohr's method
6. Acid No. of oil
7. Iodine number of edible oil
8. Saponification number of lipids

Sept - Octo

Qualitative Analysis

1. Carbohydrates : Glucose, Fructose, galactose, lactose, maltose, sucrose, starch
2. Amino acids : Tyrosine, Tryptophan, Arginine cysteine, methionine

Nov - Dec

Cell biology

1. Mitosis in onion root tip
2. Identification of plant and animal cell

Jan - feb

Preparation

1. Starch from potatoes
2. Caesin from milk

Balance

Physical balance, Electronic balance, Analytical balance, weight box, Types of error.

CLASS : I B.Sc MICROBIOLOGY
SEMESTER : I & II

SUBJECT : ALLIED BIOCHEMISTRY PRACTICAL
SUB CODE : UABCC16

July - August

Volumetric Analysis

1. Estimation of glucose by Benedicts method.
2. Estimation of glycine
3. Estimation of Ascorbic acid
4. Estimation of iron
5. Estimation of Nitrite
6. Estimation of calcium in milk

Sept - Oct

Qualitative analysis

Carbohydrates : Glucose, Fructose, galactose lactose, maltose, sucrose, starch.

Amino acids : Tyrosine, Tryptophan, Arginine cysteine

Nov - Dec

Colorimetric estimation (Demo)

Glucose by Orthotoluidine method

Jan - feb

Preparation

1. starch from potatoes
2. Casein from milk

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29/6/18

CLASS : I B.Sc BIOCHEMISTRY SEM : II

SUBJECT : CELL BIOLOGY SUB CODE : UCRCB1

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 cell) - 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.

Nov

Unit II

Components and functions of organelles structure and functions of mitochondria endoplasmic reticulum - Rough & Smooth endoplasmic reticulum, ribosomes, golgi vesicles, lysosomes, chloroplast, Peroxisomes and glyoxysomes.

Dec

Unit III

Nucleus : Nuclear membrane, nucleolus, nuclear pore and annulus - structure of chromosomes, cell division - mitosis and meiosis I & II

Jan

Unit IV

Cell membrane : Molecular organization of animal cell membrane - membrane lipids, proteins and carbohydrates - The fluid mosaic model and artificial membranes - Mitochondrial and red

feb

cell membrane, cell wall: Components and role of cell wall.

Unit V

March

Membrane functions. Cell permeability, Ion selective channels (Uniport, Antiport, Symport with example) and carriers - Transport processes, diffusion, facilitated diffusion, active transport proteins (Na^+-K^+-ATPase), Ionophores and Gap junction and tight junctions cell-cell communication (Belt and Spot desmosomes)

CLASS III B Sc BIOCHEMISTRY

SUB : MEDICAL LABORATORY TECHNOLOGY

SUB CODE : UGBCB517

Unit I

Nov

Introduction: 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

Dec

Specimen collection, Blood collection by veinpucture, capillary puncture, finger stick technique - Equipments and storage of blood collection, anticoagulants - collection and preservation of urine, sputum, throat swab, stool, CSF specimen

Unit III

Collection and processing of blood for transfusion: Preparation for blood

Jan

collection, screening, rejection, registration of donors, blood collection procedure, transportation - Clinical significance of blood transfusion.

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 sediment - Organized and unorganized elements, blood in urine. Rapid chemical tests of urine. Glucose (Benedicts test), Protein (Heat coagulation test), Ketone bodies (Nitroprusside test), Bilirubin (Fouchetis test).

Unit V

March

Histotechnology and cytotechnology: Introduction to histopathology and cytology, laboratory equipment for cytology and histology: Reagents, microscope, microtome, paraffin oven, tissue flotation bath, automated tissue processor and slide warmer. Preparation of tissues for histology, collection of specimen for cytological evaluation and its clinical significance.

CLASS : III YEARS
SUB : THERAPEUTIC AGENTS
SUB CODE : UGBCB51T

Unit I

Drug - Definition - Nature. Routes of administration - Drug absorption - drug distribution - Termination of drugs - elimination of drugs - Biotransformation

Nov

Unit II

Vaccines - definition - attenuated live vaccines - killed vaccines - immunization schedule for children

Dec

Unit III

Antibiotics : Definition, therapeutic application of antibiotics - Penicillin, erythromycin, tetracyclin, streptomycin and chloramphenicol - uses of antiseptics and disinfectants

Jan

Unit IV

Medical therapies for mouth ulcer, gall stones, urinary stones and intestinal worms.

feb

Unit V

First aid : Important 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.

March

Dr. Shaik
20/11/18

2018-2019

LESSON PLAN FOR ODD SEMESTER

PAPER	CLASS
Immunology	III-B.Sc Biochemistry
Main Practical-III	III-B.Sc Biochemistry
SBE: Diseases and Diet Theraphy	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: Primary and Secondary Lymphoid Organ - Morphology, Secretion and functions. Types of immunity. Innate immunity and acquired immunity. Cells involved in the immune system.
JULY	UNIT-II: Antigen - Essential features Epitopes. Haptens. Adjuvants. MHC Antigen. Antibodies - Types, Structure

MONTH	PORTIONS TO BE COVERED
	Properties and biological functions. Clonal selection theory. Production and application of Monoclonal antibodies
AUGUST	UNIT-III : Antigen - antibody interaction. Precipitation, Agglutination, complement fixation, lysis and opsonization. Immunotechniques : RIA, ELISA, Fluorescent antibody technique, immunoblotting technique - immuno electrophoresis.
SEPTEMBER	UNIT-IV : Humoral immunity, Cell mediated immunity. Auto immunity - Spectrum of auto immune disease - pathogenesis. Grave's disease, Myasthenia gravis. Rheumatoid arthritis, SLE, Multiple Sclerosis Complement - Salient features, classive, alterna
OCTOBER	UNIT-V : Transplantation immunology. Types of graft, Mechanism of allograft rejection. Hypersensitivity Type - I, II, III, IV and their mechanism.

REFERENCE :

Text book of Immunology by

→ Kuby
→ Arumugam
→ Dulsi fathima

III. B.Sc. BIOCHEMISTRY SBE: DISEASES AND DIET THERAPY

MONTH	PORTIONS TO BE COVERED
JUNE	UNIT-I: Food - Role of food, Food pyramids Classification of food based on chemical nature and biological function. Water - Sources of water, function and water balance. Abnormalities associated with water - Dehydration and overhydration - 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, Cardamom, Clove, Cumin, Pepper, Ginger. Beverages - Green tea, Tea, Coffee.
AUGUST	UNIT-III: Diseases due to protein - Calorie malnutrition and under nutrition (Kwashiorkar and Marasmus). Vitamins and Minerals (Calcium, Sodium, Iron, Iodine) - Sources, RDA, Function, deficiency diseases. Eating disorders - Anorexia nervosa, Bulimia nervosa, Binge eating disorder.

MONTH	PORTIONS TO BE COVERED
SEPTEMBER	UNIT-IV: Clinical Dietetics - Hypertension Renal stones. Intestinal worms, Mouth ulcer. polycystic ovaries. Fibroids. Cancer. Ovarian. Cervical and 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.
	SBE: HEALTH CARE FOR WOMEN
JUNE - JULY	UNIT-I: Health - Definition, importance of women's health. Healthy tips for women. Anemia - Types - Iron deficiency anemia. Megaloblastic anemia - causes. Symptoms, Diagnosis and treatment.
AUGUST	UNIT-II: Physiological anatomy of female reproductive system. Hormones related with female Estrogen and Progesterone puberty and Menopause. UNIT-III: Ovarian cancer, cervical cancer polycystic ovaries. Fibroids - Types Causes, Symptoms. Diagnosis and treatment

MONTH	PORTIONS TO BE COVERED
SEPTEMBER	UNIT-IV : Depression, Blood pressure Osteoporosis, Female infertility Amenorrhoea - Causes, Symptoms, Diagnosis and Treatment.
OCTOBER	UNIT-V : Urinary infection, Role of thyroid hormones, Blood group, Rh, Erythroblastosis foetalis.

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

MONTH	PRACTICALS TO BE COVERED
JUNE - JULY	COLORIMETRIC ESTIMATION:- Estimation of Creatinine by Jaffe's Method Estimation of Glucose by Orthotoluidine Method Estimation of Urea by Diacetyl Monoxine Method Estimation of Cholesterol by Zak'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.

MONTH	PRACTICALS TO BE COVERED
	Estimation of DNA by Diphenyl amine method
	Estimation of RNA by Orcinol method
	ENZYME ANALYSIS
	Determination of SGOT
SEPTEMBER	Determination of SGPT
	Effect of p^H on the activity of the enzyme acid phosphatase
OCTOBER	Effect of Temperature on the activity of the enzyme acid phosphatase
	Determination of Specific activity on the enzyme acid phosphatase
NOVEMBER	Effect of Substrate concentration on the activity of the enzyme acid phosphatase
	URINE ANALYSIS
	Methods for Preservation of Urine analysis
DECEMBER	Qualitative analysis of Urine for normal and Abnormal constituents
	HEMATOLOGICAL EXPERIMENT: (DEMONSTRATION)

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2018 - 2019

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
Main Practical - I	I - B.Sc. Biochemistry
SBE: Health Care for Women	II - years

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, Complications Diabetic ketoacidosis - Significance of fasting and post parandial blood glucose - Glucose Tolerance Test - Glycosylated Hb - Galactosemia, Fructosuria, Glycogen storage Diseases.

MONTH	PORTIONS TO BE COVERED
December	UNIT II : Disease related to lipid: Lipoproteins - Types, functions. Atherosclerosis, Ischemic Heart disease (IHD), Obesity, Factors affecting Blood Cholesterol level, Hypercholesterolemia, elementary details of Hypo and Hyper lipoproteinemia - Fatty liver, cirrhosis - Inborn errors of amino acid metabolism - Phenyl ketonuria, 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 - Glomerulonephritis Nephrotic syndrome - clearance - Definition and types - Renal function test based on glomerular filteration (Urea and Creatinine clearance) Renal plasma flow (PAH test), Tubular function phenol sulphathelein test - Gastric function test - collection of gastric contents, Examination of gastric residum, FTM, Stimulation test - Alcohol, caffeine and Histamine.

MONTH	PORTIONS TO BE COVERED
March	UNIT V: Diagnostic enzymes and Tumour markers SGOT, SGPT. Alkaline phosphatase, Amylase, Streptokinase - Cancer: etiology - morphological change in tumour cells. Tumour markers - AFP, CEA and HCG.

III - B.Sc. Biochemistry : SBE - 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 - Sources 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 radic Antioxidants - Definition, Sources. Types of antioxid Antioxidant rich foods - Fruits, Vegetables, Spices - Cinnamon, Cardamom, Clove, Cumin, Pepper, Ginger. Beverages - Green tea, Tea, coffee.
January	UNIT III: Diseases due to protein - Calorie malnutri and under nutrition (Kwashiorkor and Marasmus) Vitamins and Minerals (Calcium, Sodium, Iron Iodine) - Sources, RDA, function & deficiency

MONTH	PORTIONS TO BE COVERED
February	diseases. Eating disorders. Anorexia Nervosa, Bulimia nervosa, Binge eating disorder. UNIT IV : Clinical Dietetics. Hypertension, Renal stones. intestinal worms. Mouth ulcer, polycystic ovaries, fibroids, Cancer. Ovarian, Cervical & Breast Cancer.
March	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.

SBE: Health Care for Women

MONTH	PORTIONS TO BE COVERED
November	UNIT I: Health - Definition, Importance of women's 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.

MONTH	PORTIONS TO BE COVERED
February	UNIT IV : Depression, Blood pressure, Osteoporosis, Female infertility. Amenorrhea - Causes, Symptoms Diagnosis, Treatment.
March	UNIT V: Urinary infection, Role of thyroid hormones in women; Blood group system, Rh factor, Erythroblastosis foetalis.

Dr. Shah
31/1/18

2018 - 2019

Lesson Plan for Even Semester

Paper	Class
1. Pharmacology	III Biochemistry
2. Allied II : Biochemistry II	I Microbiology
3. Allied Practicals	"
4. Non Major Elective : Diseases and Treatment	III years

III B.Sc Biochemistry - Pharmacology

Month	Portions to be covered
Nov	UNIT I Introduction : Sources, Dosage forms, Route of administration, classification - absorption of drugs, Distribution - Binding of drugs to plasma proteins.
Dec	UNIT II Receptor - Types, Binding forces in Drug-receptor interaction and conseques of Drug - receptor interactions - Xenobiotics Phase I - Mechanism of action of Oxidation, reduction, hydrolysis and Phase III - Conjugation.
Jan	UNIT III Antibiotics : Structure and therapeutic uses of Penicillin, Streptomycin, Tetracyclin Chloramphenicol and Erythromycin ; Antiseptic and disinfectants - Structure and uses of Phenol & related compounds

Month	Portions to be covered
	of Alkyl Substituted phenols : Cresol, Thymol b) chlorinated phenols : Chloroxylenol Halogen compounds - chloramine iii) Organic mercurial - Thiomersal iv) Formaldehyde and its derivatives Nitrofurazone.
	UNIT IV
Feb	Cardiovascular drugs - Structure and action of cardiac glycosides - Digoxin, and Digitoxin ; Antiarrhythmic drugs - Structure and uses of propanol and procainamide ; Antihypersensitive agents i) Drugs acting centrally - Example : Clonidine, alpha methyl dopa ii) Ganglion blockers - Example : Pentolinium Tartarate iii) Vasodilators Example : Tolazoline iv) β - Blockers - Example : phenoxybenzamine - Structure and uses of oral hypoglycemic drugs.
	UNIT V
March	Analgesics - Morphine, Pethidine, Aspirin, Salicin, paraacetomol and phenacetin, Analgin and Indomethacin, Anesthetics - chloroform, Nitrous oxide, Trichloro ethylene, Benzocaine, Procaine, Lignocaine, cytoxic agents - Chlorambucil

2018 - 2019

Lesson Plan for odd Semester

Paper	Class
1 Enzymes	III Biochemistry
2. Allied : Biochemistry	I Microbiology
3. Allied Practicals (sharing)	I Microbiology
4. NME : Diseases & Treatment	III years

III B.Sc Biochemistry - Enzymes

Months	Portions covered	References
	UNIT - I Enzymes - Holoenzymes, Apoenzymes, Prosthetic group, Isoenzyme, Ribozyme Abzyme, Activation energy (Defination alone) - Nomenclature and IUB classification of enzymes - specificity and its types - Active site - Salient features of active site - Enzyme unit (IU, Katal and Turnover number) - Lock and Key hypothesis and induced fit theory. UNIT - II Factors affecting the rate of chemical reaction - collision theory - Kinetics of Single substrate enzyme	Trevor Palmer. Enzymes Biochemistry, Biotechnology, and clinical Biochemistry Isl Ed - Horwood Publishing, Chichester, 2001

Month	Portions to be covered	References

catalysed reaction - Michaelis and Menten equation, Brigg's - Haldane modification of MM equation, Transformation of MM equation - LB plot, Edie - Hofstee plot - Kinetics of bisubstate enzyme catalysed reaction - ping pong bi - bi mechanisms, Random order and compulsory order mechanism.

UNIT III :

Catalysis - mechanism of reaction involving acid - base catalysis, Electrostatic catalysis, covalent catalysis without factors (Mechanism of chymotrypsin) - Role of co-enzymes in reactions - NAD^+, $NADP^+$, FMN, FAD, co-Ach TPP, Pyridoxyl phosphate, Biotin, FH_4.

UNIT IV :

Enzyme inhibition - competitive inhibition - Example : Succinate Dehydrogenase - uncompetitive inhibition - Example : Aryl sulphate Irriversible inhibition - Example : Acetyl choline esterase (Kinetics not included) - Enzyme regulation - Feedback inhibition - example : HMG CoA reductase - Allosteric inhibition - Example : Aspartate transcarbamoylase - Industrial and medical applications of enzymes.

Month	Portions to be covered

UNIT V :

Multienzyme system - Mechanism of action of pyruvate dehydrogenase complex - Immobilised enzymes - various methods of immbolization (Ionic bonding, absorption, covalent bonding, micro encapsulation and gel entrapment) - Application of Immobolised enzymes

I Microbiology - Allied : Biochemistry

UNIT :

Carbohydrates : occurance, biological importance of carbohydrates Structure Classification and physical property of carbohydrate Mutarotation - 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 Occurance structure and properties of disaccharides (Maltose), Lactose, Sucrose) and polysaccharides (Starch).

UNIT II :

Amino acids : occurance, biological importance of amino acids, Structure of peptide bond, classification of amino acid based on structure, polarity of side chain and Nutritional factor - physical properties - Amphoteric nature and isoelectric pH - Chemical properties - Reactions involving carboxyl, amino acid and

Month | Portions to be covered

and both the groups - color reactions of amino acids.

Proteins : Occurance, biological importance of Proteins, functions, classification based on biological functions - physical properties - Denaturation, Salting in and salting out - Structural organisation of proteins - primary, secondary (alpha helix and Beta pleated sheet). Tertiary and quaternary Structure

UNIT III :

Nucleic acids : Structural component 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 & RNA.

UNIT IV :

Lipids - Biological importance of Lipids, Occurance - Types of fatty acids - Saturated 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 plasmogen), phosphoinositides (phosphatidyl inositol) and phosphoglycosides (sphingomylein) Glycolipids ; cerebrosides, Ganglioslides

Month

Portions to be covered

Derived lipids - Sterols (cholesterol - structure and functions) Iodine Number, Acid number, Saponification number, Reichert - meissl number of oils.

UNIT V :

Water and fat 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})

Reference Books

1. I.L Jain, Sanjay Jain - Fundamentals of Biochemistry.
2. U. Sathyanarayana - Textbook of Biochemistry
3. A.C Deb - Fundamentals of Biochemistry
4. Dr. Ambiga Shanmugam - Medical Biochemistry

I Microbiology : Allied practicals

1. Volumetric Analysis
   1. Estimation of Glucose by benedict's method
   2. Estimation of Glycine
   3. Estimation of Ascorbic acid
   4. Estimation of Iron
   5. Estimation of Nitrite
   6. Estimation of calcium in milk.
2. Qualitative Analysis

   Carbohydrates: Glucose, Fructose, Galactose, Lactose, Maltose, Sucrose, Starch

   Amino acids : Tyrosine, Tryptophan, Arginine and cysteine.

Month | Portions to be covered

3. Calorimetric Estimation (Demonstration)
   Glucose by orthotoluidine method
4. Preparation
   1. Starch from potatoes
   2. Casein from milk.

NON - Major Elective : Diseases & Treatment

UNIT I :
Diseases and its Types - Immune System - Types - Innate and Acquired - phagocytosis. Blood : composition, sickel cell Anemia, Leucopenia, Hemolysis, Bleeding disorder : osteomalacia, Rickets, Joint pain.

UNIT II :
Asthma : Types, causes, clinical features and Treatment. Tuberculosis : causes, clinical features, prevention and Treatment.

UNIT III :
Diabetes Mellitus : Types, causes, clinical features and Treatment. cancer : Types, causes clinical features, Diagnosis and treatment.

UNIT IV :
Cardiovascular Diseases : Hypertension, Heart attack - causes, clinical features and treatment Neurological diseases : Dementia, Seizures & coma causes, clinical features and Treatment

UNIT V :
Skin diseases : Alopecia Areata, Hirsutism Psoriasis, Acne Vulgaris, Dandruff - causes, clinical features and Treatment.

J. Thula
29/6/16

References

1. Jayashree Ghosh – A Textbook of pharmaceutical chemistry.
2. S.D Seth – Textbook of pharmaceutical chemistry
3. William Foye – principles of Medicinal chemistry
4. Graham D.G Smith – Textbook of clinical Pharmacology.

I Microbiology – Allied II : Biochemistry II

Month	Portions to be covered
Jan	UNIT I : Enzymes : General characteristics and and IUB classification of enzymes, Enzyme units (IU, Active site, Lock & Key and induced fit hypothesis, Effect of temperature, pH and substrate concentration on enzyme activity, Enzyme inhibition – competitive and uncompetitive inhibition (Kinetics not required) – Industrial and medical applications of enzymes.
Feb	UNIT II : Clinical biochemistry : Diabetes Mellitus, Types, causes and symptoms – Atherosclerosis Stages, Risks and consequences, obesity – Gout – protein Caloric malnutrition – marasmus and Kwashiorkor.
March	UNIT III : Intermediary metabolism : Pathway and energetic – Glycolysis, TCA cycle, β-oxidation of fatty acids, urea cycle.

Month	Portions to be covered

UNIT IV :

Hormonal Biochemistry : Hormones Defination, classification based on nature : Protein and Steroid hormone - Biological function and Disorders of Insulin, thyroid hormones, Growth hormone, oxytocin and Vasopressin.

UNIT V :

Minerals - Sources, RDA, Role and Deficiency disease of Calcium, Iron, potassium, iodine, Sodium and copper

Referenced :

1. Trevor palmer - Enzymes - 1st edition - Harword publishing - 2001
2. A.C Deb - Fundamentals of Biochemistry
3. J.L Jain, Sanjay Jain - Fundamentals of Biochemistry.

Non-Major Elective : Diseases and Treatment

Month	Portions to be covered

UNIT I :

Diseases and treatment - Its types - Immune system - Types - Innate and acquired immunity - Phagocytosis. Blood : composition, Sickel cell anemia, Iron deficiency anemia, Leucopenia, Hemolysis, Bleeding disorder : Osteomalacia, Rickets, Joint pain.

nth

Portions to be covered

UNIT II :

Asthma : Types, causes, clinical features and treatment

Tuberculosis : causes, clinical features, prevention and treatment

UNIT III :

Diabetes Mellitus types, causes, clinical features and treatment

Cancer : Types, causes, clinical features, Diagnosis & Treatment

UNIT IV :

Cardiovascular diseases : Hypertension, Heart attack - causes, clinical features and treatment. 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.

Reference Books :

1. Davidson - Principles and practice of Medicine - 9th Edition, Elsevier publication, 2002

2. Richard A Goldsby, Thomas J Kindt, Barbara A osborne, Janis Kuby - Immunology.

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References

1. Jayashree Ghosh – A Textbook of pharmaceutical chemistry.
2. S.D Seth – Textbook of pharmaceutical chemistry
3. William Foye – principles of Medicinal chemistry
4. Graham D.G Smith – Textbook of Clinical Pharmacology.

I Microbiology – Allied II : Biochemistry II

Month	Portions to be covered
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