

**Academic organiser
2018-19**

M.Sc SEMESTER I

Biochemistry: PAPER I: Chemistry and Metabolism of proteins, lipids and porphyrins

Name of the lecturer: Dr.S.Padma

MONTH/No OF CLASSES	Paper /Unit	Name of the topic
AUGUST 9	I/Unit – I: Chemistry of Amino Acids, & Proteins	<p>Classification and structure of 20 aa, essential, non–essential, unusual and non-protein</p> <p>General properties of aa, acid – base titrations, pKa Peptide bond – stability and formation, Primary structure, GN Ramachandran plots Secondary structure and motifs, α helix, β sheet, 3-10 helix Leucine zipper, Zinc finger, Trans-membrane regions, βLHL Tertiary & Quaternary structure (myoglobin, hemoglobin) Protein-protein interactions (actin, tubulin) Small peptides (glutathione, peptide hormones), Cyclic peptides (Gramicidin)</p>
SEPTEMBER 15 +3 extra	<p>I/Unit – I: Chemistry of Amino Acids, & Proteins</p> <p>I/ Unit – II: Metabolism of Amino acids, & Proteins</p>	<p>Classification of proteins-globular, fibrous, membrane, metallo-proteins, SCOP, CATH Denaturation (pH, temperature, chaotropic agents), refolding</p> <p>Metabolic fate of dietary proteins and amino acids Degradations to glucose and ketone bodies Amino acids degraded to Pyruvate, Oxaloacetate Amino acids degraded to Acetyl-CoA, Succinyl-CoA Metabolism of branched chain amino acids Role of glutamate cycle information & circulation of ammonia</p>
OCTOBER 10+3 extra	I/Unit–III: Chemistry of Lipids Porphyrins	<p>Glucose alanine cycle, urea cycle Linking of citric acid and urea cycles, regulation of urea cycle,. Genetic defects in metabolism of amino acids and urea metabolism</p> <p>Classification & biological significance of lipids & fatty acids. Steroids, Sterols, relation to vitamin D and steroid hormones</p> <p>Bile acids and salts, Phospholipids, Oils, waxes, isoprene units, Lipoproteins Glycolipids, Sphingolipids Structure & function of porphyrins (e.g. Heme, chlorophyll) Cerebrosides, gangliosides Prostaglandins, Prostacyclins Thromboxanes, Leukotrienes</p>

S. Padma

A. Sai Pad

<p>NOVEMBER</p> <p>11 +4</p>	<p>I/IV Metabolism of Lipids & Porphyrins</p>	<p>Fate of dietary lipids and Apo-lipoproteins Fatty acid biosynthesis, Desaturation of fatty acids Beta oxidation, breakdown of odd chain fatty acids, energy yields Regulation of β – oxidation, ω – oxidation & α – oxidation Metabolism of phospholipids & Sphingolipids Regulation and Biosynthesis of cholesterol and other steroids Fate of acetyl CoA, formation of ketone bodies and ketosis Biosynthesis of prostaglandins, Prostacyclins, Thromboxanes.</p>
<p>DECEMBER</p> <p>3</p>	<p>I/IV Metabolism of Lipids & Porphyrins</p>	<p>Leukotrienes Role of HDL, LDL, and Very-low-density lipoprotein (VLDL) and cholesterol levels in body Metabolism of Porphyrins and associated porphyrias.</p>

S. Padma

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Academic Organizer (2018-19)

M.Sc Biochemistry

Semester-I

Paper –II, BI 102T: Chemistry and Metabolism of Carbohydrates, Vitamins and Nucleic Acids

Lecturer: Dr. A.Sai padma

Month/ No of Teaching Days	Unit	Name of the topic
August 7	Unit – I: Chemistry of Carbohydrates	Classification, monosaccharides (aldoses & ketoses), Configuration and conformation of monosaccharides (pyranose & furanose, chair & boat), Reducing and optical properties of sugars, Stability of glycosidic bond disaccharides, oligosaccharides, Structural polysaccharides-cellulose, hemicellulose, pectin, lignin, chitin, chitosan, Storage polysaccharides; starch, glycogen, inulin, Steric factors in polysaccharides folding, sugar code and lectin,
September 14	Unit – IV: Chemistry and Metabolism of Vitamins	Glycosaminoglycans, mucopolysaccharides, hyaluronic acid. Chondroitin sulfate, keratan sulfate, dermatan sulfate, Bacterial cell wall – proteoglycans and peptidoglycans Discovery of vitamins, classification, RDA Vitamin A – source, biological role, deficiency Vitamin B1 – Thiamine – source, biological role, deficiency Vitamin C – Ascorbic acid – source. Biological role, deficiency Vitamin D – Calciferol – source, biological role, biological role, deficiency Vitamin E, Vitamin K – source, biological role, deficiency.
October 12	Unit – II: Metabolism of Carbohydrates	Vitamin B2 – Riboflavin – source, biological role, deficiency Vitamin B3 – Niacin – and B5 – Pantothenic acid – sources, biological role, deficiency Vitamin B6 – Pyridoxamine – and B7 – Biotin – source, biological role, deficiency Vitamin B9 – Folic acid – and B12 – Cobalamine – source, biological role, deficiency. Reactions, energy balance and regulation of Glycolysis, Reactions, energy balance and regulation of Gluconeogenesis, Pyruvate dehydrogenase complex, Reactions, energy balance and regulation of TCA cycle, Pentose phosphate pathway,

[PTD]

<p>November</p> <p>13 +5</p>	<p>Unit – III: Chemistry and Metabolism of Nucleic Acids:</p>	<p>regulation and significance Pasteur and Crabtree effect, Anapleurotic reactions Glyoxylate cycle, Glucuronic acid cycle, Glycogen metabolism.</p> <p>Purines, pyrimidines, nucleosides, nucleotides, unusual bases Structure of DNA – Watson Crick Model, A- and Z- forms Supercoiling of DNA – negative and positive, linking number Structure of mRNA, tRNA, rRNA, siRNA / miRNA Properties of NA – denaturation and renaturation, T_m (factors affecting T_m) and Cot curves, Heteroduplex mapping – D loops and R loops Biosynthesis of purines and pyrimidines Degradation of purines and pyrimidines.</p>
<p>December</p> <p>3</p> <p>+1</p>		<p>Regulation: <i>de novo</i>, salvation, nucleotide analogs Purines, pyrimidines, nucleosides, nucleotides, unusual bases.</p>

A. Sai Reddy

Academic Organiser (2018-19)

M.Sc- Sem-I

Biochemistry: Paper-III: BI 103T: Bioanalytical Techniques

Name Of the Lecturer: M.Usha

Month & No. of teaching days	Unit	Name of the Topic
August 4	Unit – I: Spectroscopy	Beer Lambert's Law, Molar extinction coefficient, Absorption maximum, UV-Vis: Spectroscopy, Colorimetry – principle, instrumentation, application, Fluorescence Spectroscopy – principle, instrumentation, application.
September 11+1 Extra	Unit – II: Chromatography	Atomic Absorption Spectrometry – principle, instrumentation, application, NMR – principle, instrumentation application, ESR – principle, instrumentation application, CD – principle, instrumentation, application, ORD – principle, instrumentation, application, Mass spectroscopy – principle, instrumentation, application, X-ray crystallography Partitioning and counter current distribution,
October 15	Unit – III: Centrifugation and Electrophoresis	PC – principle, instrumentation, application, TLC – principle, instrumentation, application. GC – principle, instrumentation, application Ion-exchange – principle, instrumentation, application, Gel filtration (Gel exclusion chromatography) – principle, application, Affinity chromatography – principle instrumentation, application; immune precipitation, HPLC and RP-HPLC – principle, instrumentation, application. FPLC, LC – principle, instrumentation, application, Peptide mapping and N-terminal sequencing of proteins Centrifugation,
November 19 + 7 Extra	Unit – IV: Tracer Techniques	RCF and types of rotors, Ultracentrifugation – principle, instrumentation, application, CsCl density gradient and sucrose gradient centrifugation – principle, application, Electrophoresis – moving boundary and zonal electrophoresis, Native and SDS-PAGE, IEF and 2D PAGE Agarose Gels, PFGE, Zymography, PAGE for DNA sequencing DNase-I hypersensitivity mapping, DNA-Foot-printing and Chromatin IP methods. Denaturing gels for RNA, Southern and Northern Blots Stable and radioactive isotopes, Radioactivity theory, half-life and emission spectra of half-life of Biologically useful isotopes - ^2H , ^3H , ^{14}C , ^{18}O , ^{32}P , ^{35}S , ^{125}I Isotopes used for labeling proteins (^3H , ^{14}C , ^{35}S , ^{125}I) and nucleic acids (^3H , ^{32}P), Detection of radioactivity by Scintillation counting, Autoradiography, Fluorography, Phosphor-imaging, applications, GM counter, gamma counter
December 2+1 Extra		Radiation hazards and safe disposal of radioactivity waste; luxometry and chemiluminescence as alternative to radioactivity. Isotope dilution method – pulse chase, Historic examples- ^{14}C and ^{18}O to study photosynthesis. Historic examples- ^{32}P and ^{35}S to study viral replication (Hershey-Chase experiment). Historic examples- ^{14}N and ^{15}N in DNA replication (Meselson and Stahl experiment)

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**Academic organizer
(2018-19)
M.SC I YEAR**

**Semester I, P-IV
Bioenergetics and Photosynthesis
Name of the lecturer: M.Usha**

Month & no of teaching days	Unit	Name of the topic
August (15)	Unit I Bioenergetics	Elements of importance in biochemistry (H,C,N,O,P,S), types and energy of bonds and interactions(ionic, covalent, coordinate, H-bonds, Van der Waal's, hydrophobic interactions) Law of thermodynamics, Gibbs free energy Relevance of entropy and enthalpy in biological system and reactions Biological oxidation, free energy changes, redox potential & phosphate potential. High energy bonds and high energy compounds. Electron transport chain, components & importance. Mechanisms of oxidative phosphorylation. Uncouplers & inhibitors of energy transfer. Substrate level & oxidative phosphorylation. Bioluminescence.
September (15)	Unit II Biomembranes	Composition of plasma membrane and organelle membranes of plant and animal cells. Membrane dynamics. Forces stabilizing the membranes Membrane asymmetry- Membrane Lipids and proteins. Fluid mosaic model of membrane. Integral membrane proteins and their secondary structures- α helices and β barrels Methods of detecting transmembrane proteins, hydrophathy plots. Lipid anchored membrane proteins-acyl, prenyl and GPI anchors. Artificial membranes: Liposome, micelles and vesicles Reconstitution of functional membrane systems from purified components RBC membrane.
November (10 + 4 extra)	Unit IV Photosynthesis	Photosynthesis-structure of organelles involved in photosynthesis in plants & bacteria.Light& dark reactions, Hill reaction. Light receptors-chlorophyll; light harvesting complexes, bacteriorhodopsin. Photosystem I & II and their location.Mechanism of quantum capture & energy transfer between photosystems. Proton gradients & electron transfer in chloroplasts. Cyclic and non-cyclic PhotophosphorylationC3 pathway of carbon metabolism. C4 pathway & CAM metabolism. Regulation of photosynthesis.
December (1)	Unit IV	Photorespiration

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**Academic organizer
(2018-19)
M.Sc I YEAR**

**Semester I, P-IV
Bioenergetics and Photosynthesis
Name of the lecturer: Dr. Kiranmai. P**

Month & no of teaching days	Unit	Name of the topic
October (4)	Unit III Membrane Transport	Transport across cell membranes. Fick's law. Types of transport- simple diffusion, passive & facilitated diffusion. Active transport-primary & secondary active transport systems.
November (11)	Unit III	Formation of ion gradients across membrane (proton gradients in organelles) Aquaporins and ionophores. Gated channels (voltage & chemical). Group translocation. Transport ATPases, Na ⁺ /K ⁺ ATPases. ABC transporters; MDR1, CFTR Channels and pores. Bulk transport-endocytosis & exocytosis. Phosphotransferase

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Academic Organizer (2018-19)
M.Sc Biochemistry II Year, Semester-III

Paper-I: BI 301T: Gene Regulation and Genetic Engineering

Lecturer: Dr. A.Sai Padma

Month/ No of Teaching Days	Unit	Name of the topic
June 8+2	Unit – I: Gene Regulation in Prokaryotes and Viruses	Operon concept for gene regulation Positive (+ve)&Negative (-ve) control, Lac operon Attenuation – Trp operon Dual promoters – gal operon: Dual function of repressor – ara operon Phase variation in <i>Salmonella</i> flagellar protein synthesis Sporulation gene expression in <i>Bacillus</i>
July 17+2	Unit – II: Gene Regulation in Eukaryotes	Riboswitch , Anti – termination in lambda phage Lytic / lysogenic switch in lambda phage Control of plasmid copy number Chromatin structure in active and inactive regions – DNA methylation. Eu-chromatin, histone acetylation, H2AX foci, histone code Transcriptional control – cell specific expression – promoters, enhancers, Transcription factors. Post- transcriptional control – alternative splicing RNA editing. RNA transport and stability. Translational feedback. Gene silencing – inactivation of mammalian X chromosome. Regulation by siRNA Gal operon of yeast. MAT locus and mating type switch in yeast,
August 10 +2	Unit-III: Recombinant DNA Technology	Antigenic variation in <i>Trypanosoma</i> Enzymes in rDNA technology: Restriction endonucleases (discovery, properties).DNA and RNA polymerases Enzymes in rDNA technology: Nucleases, Kinases. Phosphatases, and Ligases Prokaryotic vectors (plasmids, cosmids, phage, phagemid, BAC) Eukaryotic vector-YAC and Expression vectors (insect, plant, mammalian cells)..Shuttle vectors, Targeting vectors Construction of cDNA and genomic DNA libraries Screening a library (+ve)&(-ve) selection strategies, Preparation of probes.

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September 14+2	Unit – IV: Genetic Engineering:	<p>Southern blotting, Northern blotting, South-Western blotting. Creating KO cells, Cre – Lox systems.</p> <p>Yeast 2 hybrid Phage display Reporter genes – GFP, b – gal, luciferase Expression in heterologous systems – bacteria Expression in heterologous system – yeast cells Expression in heterologous system – insect cells Expression in heterologous system – mammalian cells Molecular markers – RFLP, AFLP</p>
October 3		<p>Random amplification of polymorphic DNA (RAPD), Short tandem repeat, Single-nucleotide polymorphism (SNP), Ribotyping Molecular markers – RFLP, AFLP.</p>

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Academic Organizer (2018-19)
M.Sc Biochemistry, Semester-III
Paper II
Immunology and Immunotechnology

Lecturer: D.Rajani

Month and No of teaching days	Unit	Name of the topic
June 11	Unit I	Components of the Immune System History of immunology. Natural & acquired immunity, Specific & non-specific immune response. Cells & organs of immune system. Antigenic determinants, Epitopes, Haptens, Properties of strong antigens. Adjuvants – types, mode of action, and applications. Classification, structure, and biological properties of immunoglobulins. Isotypes, allotype, idiotypes. Theories of antibody formation. Generation of antibody diversity
July 16	Unit I	Genomic rearrangements of light and heavy – chain loci in B-cells Genomic rearrangements in T-cell receptor, structure of CD3, CD4, CD8.
	Unit II	Events in Immune Response Humoral & cell-mediated immune response. Activation of T cells & B cells. Kinetics and regulation of primary and secondary immune response. MHC proteins structure & functions. Antigen processing & presentation. Transplantation immunology. Graft Versus Host Disease. Complement fixation: pathways and biological consequences. Discovery and action of interferons. Cytokines in inflammation, obesity and cancer.
August 12	Unit II	Tumor immunology.
	Unit III	Immune Disorders Hypersensitivity; Coombs classification. Type I-V hypersensitivity. Tests for diagnosis of hypersensitivity (Coombs), Tuberculin test. Auto immune diseases; classification Study of selected auto – immune disorders of types I – V. Immuno- deficiency disorders – primary and secondary deficiencies. Gene therapy for ADA deficiency and Immunology of AIDS.
September 14	Unit III	Immunology of AIDS Immunosuppressive drugs and agents & their mechanism of action. Immune evasion by bacteria and viruses.
	Unit IV	Immunotechnology production of polyclonal antibodies; Animals models for production of antibodies. Inhibition of Agglutination, Complement fixation test, Inhibition of complement fixation. ELISA, RIA Western Blots; use of antibody staining for FACS. Hybridoma technology – production of monoclonal antibodies; applications in research and immunotherapy.
October 7	Unit IV	Methods of antibody purification: Salt precipitation, Affinity chromatography. Antigen-antibody binding (Equilibrium dialysis, Agglutination tests (Direct and indirect), antibody engineering Types of Vaccines Conventional vaccines - killed, attenuated, and subunit vaccines. Modern vaccines; peptide, DNA, recombinant / vector, and anti-idiotypic vaccines. Schedules of common vaccination, Benefits and adverse consequences of vaccination.

D.Rajani

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**Academic Organiser 2018-19
M.Sc SEMESTER III**

Biochemistry: Paper-~~IV~~ BI 303T: Cell signaling, Differentiation and methods of cell study
Name of the lecturer: **Dr.S.Padma**

MONTH/No of Classes	Paper /Unit	Name of the topic
JUNE 11	III/ UNIT I- Ultra structure of Cell	Structural organization of prokaryotic cells, Structural organization of eukaryotic cells (Plant/animal cells) Ultra structure of mitochondria, chloroplast, nucleus. ER. Golgi etc Extracellular matrix-collagen, elastin, fibrillin, fibronectin, laminin & proteoglycans. Integrins.
JULY 17	III/I III/ Unit – II: Methods of Cell Study	Cell junctions, Cell adhesions, Cytoskeleton-microtubules, microfilaments and myosin, Totipotency, General strategies of cell cycle and its regulation, Early embryonic cell cycle & M-phase maturation factor Simple and compound microscope Phase contrast, dark field and polarization microscopy, Electron microscopy, SEM, TEM; freeze fracture, Fluorescence and Confocal microscopy; imaging live cells, FRET and FRAP, Atomic force microscopy, Flow-Cytometry and cell sorting (FACS), Plant tissue culture.
AUGUST 14	III/II III/ Unit III: Cell Signaling	Animal and insect tissue culture, Methods of cell disruption and fractionation, isolation of organelles. Cell communication and types of signaling molecules, Types of receptors and their structure, Monomeric and trimeric G-proteins and their role, Second messengers – cAMP, cGMP, Ca ⁺² , calmodulin, inositol, NO, Introduction of signaling components in bacteria, Chemotaxis, Plant signaling system an over view.
SEPTEMBER 14	III/III III/ Unit IV: Cell & Differentiation	Stress signaling in plants (biotic), Stress signaling in plants (abiotic), Plants hormones and their mechanism of action Overview of developmental regulation, Platelet derived growth factor (PDGF); Epidermal growth factor (EGF), Insulin like growth factor (IGF), Nerve growth factor, Vascular endothelial growth factor (VEGF), Tumor necrosis factor (TNF) & erythropoietin, Fibroblast & muscle cell differentiation.
OCTOBER 4	III/IV	Formation of body pattern in Drosophila, Apoptosis and apoptosome, Modes of action of TS genes – p110, p16, p21, Phosphatase and tensin homolog (pTEN), p53 and c-Myc

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Academic Organiser (2018-19)

M.Sc- Sem-III

Bio chemistry: Paper-IV: BI 304T: Endocrinology and Metabolic Disorders Name Of the Lecturer: M.Usha

Month & No. of teaching days	Unit	Name of the Topic
June 9+5 Extra	Unit – I: Hormones and Endocrine glands	History of endocrinology, Organization and classification of hormones and endocrine systems, Basic mechanism of action of peptide hormones and receptors Basic mechanism of action of steroid , hormones and receptors, Chemistry physiology, and disorders related to Hypothalamus-Pituitary axis, Chemistry physiology, and disorders related to thyroid and parathyroid glands, Glycoprotein hormones (LSH, FSH, TH, hCG, POMC), Growth hormone family (GH, hCS Prolactin), Adrenal hormones, Gonadal hormones
July 16+1 Extra	Unit – II: Endocrine regulation Unit – III: Disorders of Amino Acid and Carbohydrate Metabolism	Xenoestrogens and phytoestrogens Regulatory pathways (positive, negative, feedback loops), Regulation of biosynthesis of steroid hormones by peptide hormones (LH, FSH, ACTH) Endocrine regulation of growth, Endocrine regulation of stress, Endocrinology of Ca homeostasis, Endocrinology of blood sugar, hunger, digestion, and obesity Endocrine regulation of renal function, Endocrine regulation of cardiovascular system (angiotensin, BNP, ETI), Endocrinology of fertility (changes in menstruation, pregnancy, and menopause), Medical uses of steroid hormones (contraception, HRT, hydrocortisone, anabolic steroids), Erythropoietin, Adipocytokines, Orexins Disorders of aromatic amino acid metabolism,
August 12		Disorders of proline and hydroxyproline metabolism, Disorders of lysine metabolism, Hemoglobinopathies; Thalassemia, Genetic defects in metabolism of amino acids (maple syrup urine disease, homocystinuria, methyl malonic Acidemia), Genetic defects in metabolism of urea (Argininemia, Argininosuccinic Acidemia, Carbamoyl Phosphate Synthetase-I deficiency) Disorders of glycogen storage, Disorders of fructose and Galactose metabolism
September 14	Unit – IV: Disorders of Lipids and Nucleic Acids Metabolism	Pentosuria, Diabetes Disorders of acid Lipase deficiency, Farber's disease, Neeman-Picks disease, Goucher's disease, Krabbe disease, Sulphatide-lipidosis disease,
October 3		Fabry disease, Downs and Turner's syndrome, Hyperuricemia and Gout, Hereditary Xanthinuria and Lesch-Nyhan syndrome


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**Academic organizer
(2018-19)
M.Com II YEAR (CBCS)**

Semester - III

Interdisciplinary Course (IDC): Nutrition & Diet Planning

Name of the lecturer: Prity Mishra

Month & no of teaching days	Unit	Name of the topic
June 2 (4 extra)	Unit I Introduction to Nutrition	Food as source of nutrients, functions of food. Relationship between food, nutrition and health, Basic food groups and food pyramid. BMI (Body mass index) and nutritional status. Glycemic index
July 4 (4 extra)	Unit I Introduction to Nutrition	Nutritive value of Foods: Cereals, Legumes, Nuts and Oil. seeds. Nutritive value of Foods: Milk and milk products, Egg and egg products, Meat, fish, vegetables and fruits. Role of fiber in human nutrition. Anti-nutritive factors, Trans fatty acids in food substances. Common approved food additives, Food allergens.
August 6 (2 extra)	Unit II Nutrition in health and disease	Nutrition - Fitness, Athletics & Sports. Diet Plans for individual's daily food intake in health conditions of anemia and hypertension. Diet Plans for individual's daily food intake in health conditions of cardiovascular diseases and diabetes
September 6	Unit II Nutrition in health and disease	Diet plan in pregnancy and lactation, Diet plan for child health, Calculation of calorific and nutritive value of foods, Food sanitation and hygiene, Common Food adulterants, Food Laws and standards.
October 2	Unit II Nutrition in health and disease	Good cooking practices for preserving nutritive value of foods.

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Department of Biochemistry

M.Sc (Biochemistry)II Year

SEMESTER III (2018-19)

Paper (SEC): Clinical laboratory diagnostics

Name of the lecturer: Dr.S.Padma

MONTH /no of teaching days	Unit	Name of the topic
JUNE 6	I	Specimen collection and processing, Handling of specimens
JULY 8	I	Haematology parameters, Autoanalyzer-Evaluation of different biochemical parameters in an autoanalyzer.
August 8	II	Collection and preservation of urine samples, Urine analysis, measurement of blood pressure, Histopathology, Tissue sectioning and staining
September 6	II	ECG, Quality control and assurance in labs
October 2	II	Dispatch of reports with clinical correlations

S. Padma

Dr. Sai Pad

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M. Sc. (Biochemistry) II Year
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**BHAVAN'S VIVEKANANDA COLLEGE
OF SCIENCE, HUMANITIES AND COMMERCE
Sainikpuri, Secunderabad-500094
Autonomous College
Affiliated to Osmania University**

TEACHING PLAN: 2018-19

Program: M. Sc Biochemistry

Paper Title: Enzymology P-1

Name of the faculty: Dr.A.Sai Padma	Department: Biochemistry	Year/Semester: I/II	No. of Classes per week: (4 hrs/week) 4 Credits
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Learning Objective: To understand the role of enzymes in metabolism and their regulation.

S.No	Month & Week	Units	Syllabus	Additional Input/ Value addition	Teaching Method	Student/ Learning activity
1.	December 4 th week	I	Properties of enzymes, protein conformation & catalyses		Chalk & Board	
2.	January 1 st week	I	Thermodynamics of catalysis, Energy of activation, Relation of ΔG and K_{eq} . Coupled reactions (endergonic and exergonic) in biochemical pathways		Chalk & Board	
3.	January 2 nd week	I	Nomenclature and classification of enzymes Metal, co-factor, and co-enzyme requirements. Methods to isolate and purify enzymes		Chalk & Board	Exercise on enzyme nomenclature
4.	January 3 rd week	I	Assays, Activity Units and Specific activity High-Throughput enzyme assays		Chalk & Board., PPT	
5.	January 4 th week	I	Chemicals to identify active site residues: Arg, Cys, Lys, His. Site-directed mutagenesis to identify active site residues: Triose Phosphate Isomerase		Chalk & Board	
6.	January 5 th week	II	Single substrate assumptions, Michelis lis-Menten ki (derive equation and transformations)		Chalk & Board	Practice of derivation of M-M equation
7.	February 1 st week		Steady state, Briggs -Haldane equation.		Chalk & Board	

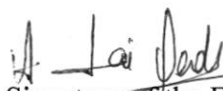
8.	February 2 nd week	II	Lineweaver Burk, Eadie Hofstee, Hanes plots. Bisubstrate reactions: sequential mechanism, compulsory order and random order mechanism Non – sequential mechanisms, ping – pong mechanisms.	Chalk & Board	Comparative analysis of all bi-substrate mechanisms
9.	February 3 rd week	II	Distinction between ordered and random addition of substrates and products release. Factors affecting catalysis (pH, temperature, pressure, enzyme and substrate concentration)	Chalk & Board	
10	February 4 th week	II	Enzyme inhibition: Types of reversible inhibitions – competitive, non-competitive, un – competitive and mixed inhibition. Irreversible inhibition-covalent modification (suicide inhibition). Substrate inhibition, feedback inhibition and allosteric inhibition.	Chalk & Board	Practice session of all inhibitions graphs
11	February 5 th week	III	. Chemical nature of enzyme catalysis: General acid – base, Covalent and metal ion catalysis. Transition state, proximity and orientation	Chalk & Board	
12	March 1 st week	III	Mechanism of co-enzymes: pyridoxal phosphate and flavin nucleotides,	Chalk & Board	
13	March 2 nd week	III	Catalytic mechanism of RNase Catalytic mechanism of Chymotrypsin, Trypsin Catalytic mechanism of Lysozyme Catalytic mechanism of Carboxypeptidase, Subtilisin	Chalk & Board	Test on mechanisms of enzyme catalysis.
14	March 3 rd week	III	Slow transition and Hysteretic behavior in enzymes. Catalytic RNA and catalytic antibodies Enzyme inhibitors as drugs: RT and Protease inhibitors as anti-HIV drugs	Chalk & Board	
15	March 4 th week	IV	Convergent and divergent evolution of enzymes Reversible and irreversible activation of e (phosphorylation, pro-enzymes) Enzymes activation by ligand binding and dime (protein tyrosine kinase receptors)	Chalk & Board	
16	March 5 th week	IV	Allosteric enzymes; binding of ligands to prot cooperativity, Hill plot for Myoglobin and Hemogl sigmoidal kinetics; MWC and KNF models. Significance of sigmoid behavior. Study of ATCase as a typical allosteric enzyme.	Chalk & Board	Comparison of MWC and KNF models.


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17.	April 1 st week	IV	Regulation of Glutamine Synthetase. Multiple forms of enzymes-Lactate dehydrogenase. Multi-enzyme complexes & significance -Fatty synthase complex.		Chalk & Board., PPT	
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Learning Outcomes:

Students will be able to gain concepts of enzyme catalysis, mode of action and their regulation.


Signature of the Faculty


Signature of the HOD

Academic organizer
(2018-19)
M.Sc I YEAR

Semester II, P-II
Molecular Biology

Name of the lecturer: Dr. Kiranmai. P

Month & no of teaching days	Unit	Name of the topic
January (17)	Unit I DNA Replication	Models of replication – random, conservative, semiconservative Prokaryotic and eukaryotic DNA polymerases, helicases, ligases, topoisomerases Initiation – primosome, ori-sequences, accessory proteins Elongation – replisome, leading and lagging strands, Okazaki fragments Termination, Inhibitors of replication. Replication of circular chromosomes by theta model -E. coli, ϕ X 174. Replication of circular chromosomes by rolling circle (lambda phage) and strand displacement models (mt-DNA). Replication of linear chromosomes, telomeres, telomerase. Amplification – Polytene and double minute chromosomes. <i>In vitro</i> replication – PCR
	Unit II DNA Repair	Types of damage – oxidation, deamination, alkylation, adducts, breaks Direct repair – MGMT, photo-reactivation, AlkB. Base Excision Repair (Short and Long Patch)
February (11)	Unit II	Nucleotide Excision Repair. Mismatch Repair. Repair of DSBs by NHEJ and Homologous recombination. Holiday junctions and repair of collapsed forks SOS and bypass repair. Diseases due to defects in DNA repair. Roles of ATM, BRCA in DNA repair
	Unit III Transcription	Principles of transcription. prokaryotic RNA polymerases Bacterial transcription -Initiation – promoter sequences. Elongation and termination of transcription– rho dependent and independent Basal, Constitutive and regulatory levels of transcription.
March (27)	Unit III	Eukaryotic DNA dependent RNA polymerase -I (ribosomal repeats). Polymerase -II, Promoters and enhancers. Polymerase-III, 5s and tRNA. Post-transcriptional modifications - capping, Poly A addition. Splicing and RNA editing; Inhibitors of transcription.
	Unit IV Translation	Nature of genetic code, Wobble hypothesis. Ribosomes, structure, functional domain and subunit assembly Components and mechanism of translation. Initiation, elongation and termination of translation in Prokaryotes Initiation, elongation and termination of translation in Eukaryotes Inhibitors of protein synthesis. Translational controls. Non-ribosomal protein synthesis- antibiotic peptide. <i>In vitro</i> translational systems -Wheat germ, rabbit reticulocyte lysate and <i>Xenopus</i> Oocyte. Post translational modifications of proteins. Role in targeting (isoprenylation)



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M.SC I YEAR**

**Semester II, P-III
Biochemical Genetics and Model Organisms
Name of the lecturer: M.Usha**

Month & no of teaching days	Unit	Name of the topic
January (12 + 7 extra)	Unit I Mendelian Genetics Unit II Linkage and Mapping	Mendel's Laws, Importance of meiosis in heredity Non-Mendelian Inheritance – Maternal effect, Maternal influence, Cytoplasmic inheritance. Gene interactions - Epistasis, Expressivity, Penetrance. Sex linked, sex limited, and sex influenced genes; Polygenic inheritance and polyploidy. Mutations (spontaneous / induced, somatic / germinal, forward / reverse, transition / transversions) Mutations (Silent, missense, nonsense, and frame shift mutations, conditional, leaky). Detection, selection & isolation of microbial mutants, Estimation of mutation rates. Reversion and suppression of mutations Mutagens – physical, chemical. Transposon mutagenesis, site-directed mutagenesis. Discovery of linkage, Morgan's experiments Cytological proof of crossing over. 2- and 3- point crosses.
February (15 + 3 extra)	Unit II Unit III Bacterial Genetics	Recombination, Interference. Tetrad analysis. Mapping human genes by pedigree analysis; Fundamentals of population genetics (HW Law). Pedigrees of AR, AD, XR, and XD inherited traits Mobile genetic elements – Zea Ac, Ds and Spm elements <i>Drosophila copia</i> , Yeast Ty elements. Using recombination to make knockout cells / organisms. Discovery of conjugation. Mapping bacterial genes by conjugation Discovery of transformation. Mapping bacterial genes by transformation Discovery of transduction.
March (16 + 2 extra)	Unit III Unit IV Model Organisms	Mapping bacterial genes by transduction Discovery of transposition. Structure of transposons, replicative and conservative transposition, use as mutagens. Mapping phage genes – Fine structure of rII locus: Complementation analysis. Fine structure of rII locus: Deletion mapping. <i>Dictyostelium</i> to study cell – cell communication and differentiation. <i>Saccharomyces</i> to study homologous recombination in mating type switch; site of formation of buds. <i>Neurospora</i> to study one gene – one enzyme hypothesis. <i>Drosophila</i> to study embryonic development (homeotic mutations). <i>C. elegans</i> to study development and nervous system. <i>Danioto</i> to study vertebrate development, GLO fish. <i>Xenopus</i> to study embryogenesis.
April (5)	Unit IV	<i>Mus</i> inbred and knockout strains, NOD and nude mice. <i>Zea mays</i> to demonstrate cytological proof of crossing over. <i>Arabidopsis</i> to study flower development.

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Teaching plan 2018-19

Program: M.Sc(Biochemistry)

Course Title (paper title): Biostatistics and Clinical Biochemistry

P-IV

Name of the faculty: Dr.S.Padma	Department: Biochemistry	Year/Semester: I/II	No. of classes per week: 4
Learning objectives To explain the importance of statistical methods that would be helpful in designing experiments and discuss the biochemical basis as well as the diagnosis of diseases.			

S.No	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity
1.	December /3 rd Week	I	Unit – I: Biostatistics-I Biostatistics fundamentals (sample, population, variable); Types of variables, Measurement and measurement scales Measures of central tendency (mean, median, mode)		Chalk and board Power point presentation	Problem solving
2.	December /4 th Week	I	Measurement of dispersion (range, variance, standard distribution) Study of bivariate data: correlation and regression;		Chalk and board Power point presentation	Problem solving
3.	January/1 st Week	I	Graphical methods to depict data (histograms, bar-plots, pie charts, line graphs), Probability and probability distribution (Normal, Binomial, Poisson), Student's t – test		Chalk and board Power point presentation	Problem solving

[P-IV]

4.	January/ 2 nd Week	I II	Chi – square test; Contingency tests ,CRD: Completely Randomized Design; 1-way ANOVA, RCBD: Randomized Complete Block Design; 2-way ANOVA Unit II: Introduction to Clinical Biochemistry Precision, reliability, reproducibility and other factors in quality control. Normal values in health and diseases.		Power point presentation	
5.	January/ 3 rd Week	II	Radio isotopes in diagnosis. Specimen collection. Automation and QA in clinical laboratories.		Power point presentation	
6.	January/ 4 th Week	II	Examination of Urine, Blood, Sputum & CSF, Storage of specimens, Clinical laboratory informatics		Power point presentation	
7	February/ 1 st week	II	Renal function tests osmolarity and free water clearances, acute and chronic renal failure, Liver function tests Gastric function tests		Chalk and board	
8	February/ 2 nd week	II III	pancreatic function tests Unit III: Pathophysiology Free radical metabolism, ROS in disease Plasma proteins in health and disease, Para proteinemias, proteinuria.		Power point presentation	
9	February/ 3 rd week	III	Hyper lipo proteinemias and lipidemias Clinical application of plasma enzyme assays in cardiac, liver and skeletal diseases Jaundice- classification and differential diagnosis.		Power point presentation	
10	February/ 4 th week	III	Nutritional assessment therapy and monitoring Cholesterol, sodium and blood pressure Eating disorders: anorexia and bulimia.		Power point presentation	Short answer questions
11	March/ 1 st week	III	Physiological interrelationship between cardiovascular, respiratory and renal systems.		Power point presentation	

(contd)

		IV	Unit IV: Molecular diagnosis of genetic defects: Pregnancy test, prenatal diagnosis & genetic counseling, Diagnosis of anemia, thalassemia.			
12	March/ 2 nd week	IV	Diagnosis of genetic diseases by molecular biology techniques (cystic fibrosis, hemochromatosis, thalassemia, sickle cell diseases).		Power point presentation	
13	March/ 3 rd Week	IV	DNA probes; restriction fragment length polymorphism (RFLP); polymerase chain reaction (PCR); Amplification of mRNA. AIDS, Clinical diagnosis.		Power point presentation	
14	March/ 4 th week	IV	Oncogenic enzymology: acid phosphatase, alkaline phosphatase, lactate dehydrogenase Body fluid constituents of use in oncology Newborn screening: PKU, tyrosinemia, aminoacidurias, organic acidurias.		Power point presentation	
15	April/ 1 st Week	IV	porphyrias Acetylcholinesterase and other tests on amniotic fluid; chromosomal abnormalities by cytogenetics		Power point presentation	
16	April /2 nd week		Revision		Previous year question papers	Assignments
Learning Outcomes: Student will use statistical methods for experiments and will also be able to relate biochemical changes to disease conditions						

S. Padma
Signature of the Faculty

A. Sai Deb
Signature of the HOD



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Program: M.Sc(Biochemistry)

Course Title (paper title): Physiology and Xenobiotics P-1

Name of the faculty: Dr.S.Padma	Department: Biochemistry	Year/Semester: II/IV	No. of classes per week: 4
Learning objectives: To understand the physiology of nerve transmission, muscle contraction, factors influencing fertility as well as the detoxification process that helps in maintaining good health.			

S.No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity
1	November/ 3 rd week	1	Unit – I: Neurophysiology Types of neuronal cells – Neuroglia, microglia, astrocytes, oligodendrocytes, Schwann, satellite and epididymal cells Nerves: regeneration of nerve fibers, generation of nerve impulse, all or none principle	Animation on nerve transmission	Power point presentation	
2	November/ 4 th week	1	Mechanism of synaptic transmission, transmission of nerve impulse, Types of neurotransmitters and their receptors, mode of signaling		Power point presentation Chalk and Board	
3	December /1 st Week	1	Electrical synapse and giant neurons, Division of vertebrate nervous system: CNS, PNS, ANS, regions of the brain Sensory organs – eye, ear, skin, tongue, Vision: visual system, rhodopsin and classical GPCR mechanism, termination of visual signal.		Power point presentation	
4	December /2 nd Week	I	Cone cells, specialization in color vision, physiology of colour blindness. Similarity between vision, olfaction and gustation. Unit – II: Structure and Physiology of Muscle		Power point presentation	Solving multiple choice questions

[PTD]

		II	Structure of various types of muscle: striated, cardiac, smooth, fast twitch, slow twitch,			
5	December /3 rd Week	II	Mechanism of muscle contraction, regulation of contraction, Role of actin and myosin in non-muscle cells. Cytochalasins and cytokinesis. Muscle gene expression, regulation at transcriptional and posttranscriptional level.		Power point presentation	
6	December /4 th Week	II	Role of muscle proteins in cell locomotion, Neuro-muscular transmission, Electromyography. Sherrington starling Kymograph (recording drum)	Animation on electromyography	Power point presentation	
7	January/1 st Week	II III	Disorders of muscle (dystrophy, myopathy, monocytosis, myotonia, paralysis, Myasthenia gravis) Detection and treatment of muscle disorders, Unit – III: Human Reproductive Biology: Female reproductive system: anatomy and endocrinology, Causes of female infertility (acquired and genetic), treatments		Power point presentation	Solving multiple choice questions
8	January/ 2 nd Week	III	Male reproductive system: anatomy and endocrinology, Causes of male infertility (environmental and genetic), treatments		Power point presentation	
9	January/ 3 rd Week	III	Puberty, reproductive aging (menopause and andropause) Gametogenesis and fertilization (natural and assisted (<i>in vitro</i>)), implantation and placenta Milestones in first trimester of pregnancy (http://www.ehd.org/virtual-human-embryo/)		Power point presentation	Short answer questions and answers

[contd ?

10	January/ 4 th Week	III IV	Milestones in second trimester of pregnancy, Milestones in third trimester of pregnancy, child birth Placenta as source of stem cells, cord banking Unit – IV: Liver and Xenobiotics Liver functions, pharmacopeia drug deposition and mechanisms of drug detoxification		Power point presentation	
11	February 1 st week	IV	Cytochrome P450 enzymes, molecular biology, catalytic cycle, isozymes, inhibitors Dose response relationship, drug-receptors interactions		Chalk and board	
12	February/ 2 nd week	IV	Pharmacodynamics; pharmacokinetics, Phase I reactions – modifications, Phase II reactions – conjugation		Power point presentation	
13	February 3 rd week	IV	Phase III reactions - modifications and elimination, Environmental factors influencing drug metabolism		Power point presentation	
14	February/ 4 th week	IV	Effects and metabolism of model toxins: aflatoxins, bacterial exotoxins (types I, II, and III) Nutrient drug interactions – I and II		Power point presentation	Short answer questions and answers
15	March/1 st week		Revision		Previous year question papers	Assignments

Learning outcomes: Student will be able to compare neurotransmission with muscle contraction, relate reproductive physiology to infertility and examine the significance of detoxification processes in liver.

S. Padma
Signature of the Faculty

A. Lal Dada
Signature of the HOD



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Teaching plan 2018-19

Program: M.Sc(Biochemistry)

Course Title (paper title): Bioinformatics

P-11

Name of the faculty: Dr.S.Padma	Department: Biochemistry	Year/Semester: II/IV	No. of classes per week: 4
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Learning objectives: to explain the importance of genomics, transcriptomics and proteomics methods of analysis and describe the concepts of synthetic genes.

S.No.	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student/learning activity
1	November/ 3 rd week	I	Unit – I: Genomics Genomics and branches of genomics (Why study a genome?), HGP and Strategies for sequencing genomes (shotgun and hierarchical sequencing), 1 st generation sequencing methods (Maxam and Gilbert Method; Sanger's method)		Power point presentation	
2	November/ 4 th week	I	2 nd and 3 rd Generation DNA sequencing methods (Next Generation Sequencing) Genetic and Physical maps of the genome, EST, STS, DNA sequence databases, Use of databases; data mining	Animation on next generation sequencing	Power point presentation	
3	December / 1 st Week	I	Comparing DNA sequences, pairwise local and global alignment, BLAST, FASTA, PAM and BLOSUM matrices		Power point presentation Chalk and board	Retrieving sequences from database
4	December / 2 nd Week	I	Multiple sequence alignments (Phylogenetic trees, Clustal-W, COBALT) Epigenomics and metagenomics		Power point presentation	Performing sequence alignments

		II	Unit – II: Transcriptomics Relation of transcriptome to genome and proteome (Why study a transcriptome?)			
5	December / 3 rd Week	II	Tools of transcriptomics: Northern blots, RNase protection assays, RT-PCR and Q-PCR HT tools of transcriptomics: Microarrays for expression profiling, alternate sequencing, HT RNA sequencing: SAGE, MPSS		Power point presentation	<i>Insilico PCR</i>
6	December / 4 th Week	II	RNA-Seq, GIGA Identifying expressed sequences by ChIP-seq, DNase-seq ENCODE Project (Encyclopedia of DNA Elements),		Power point presentation	
7	January / 1 st Week	II	Design and analysis of siRNA / RNAi for expression analysis; siRNA libraries Anti-sense oligos for regulating transcriptome, Regulation by miRNA, Extent and role of ncRNA		Power point presentation	
8	January / 2 nd Week	II III	GWAS association with phenotypes Transcriptome databases (ESTs, Transcriptome Shotgun Assembly, ArrayExpress) Unit – III: Proteomics Relation of proteome to genome and transcriptome (Why study a proteome?) HUPO goals and accomplishments		Power point presentation	Solving multiple choice questions
9	January / 3 rd Week	III	Methods for sequencing proteins: Edman degradation 2D gels and peptide maps MS – MALDI. LC-MS, Tandem MS (MS-MS) Micro-arrays for proteins	Animation on MALDI-TOF	Power point presentation	
10	January / 4 th Week	III	Proteins motifs, sequences, and structure databases; Peptide sequence and MS profiles databases, Comparing protein sequences, alignment		Power point presentation	

A. Sai Pad

11	February 1 st Week	III IV	Predicting secondary structure- <i>ab initio</i> , Homology folding, threading Post-translational modification (kinome, glycosylation) Unit – IV: Synthetic Biology Comparative genomics, evolution of human karyotype Sequencing genomes of individuals; ethical concerns,		Power point presentation	
12	February/ 2 nd Week	IV	SNPs and human disease Genomics for rational drug design and drug discovery, Pharmacogenomics		Power point presentation	
13	February 3 rd Week	IV	Nutrigenomics, Metabolomics PCR techniques to create synthetic genes and genomes		Power point presentation	
14	February/ 4 th Week	IV	Minimal genome concept Building an artificial phage; Building an artificial bacterium Metagenomics for study of ecological samples		Power point presentation	Short answer questions and answers
15	March/ 1 st Week		Revision		Previous year question papers	Assignments
Learning outcomes: Student will be able to differentiate the genomic, transcriptomic and proteomic methods for analysis and relate the methods to construct synthetic genes.						

S. Padma
Signature of the Faculty

M. Sai Reddy
Signature of the HOD

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Teaching Plan 2018-19

Program: M.Sc Biochemistry Course Title (paper title): Biotechnology

P-III

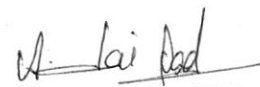
Name of the faculty: S. Vanitha	Department: Biochemistry	Year/Semester: II / IV	No. of classes per week: 4 hours/week (4 Credits)
<p>Learning objective: To understand the influence of biotechnology with the use of microbes, animals and plants for the production of biotechnological products.</p>			

S. No	Month & Week	Units	Syllabus	Additional Input/ value addition	Teaching method	Student /learning activity
1	November 4 th Week	IV	Protein Engineering: Methods of immobilization of enzymes and cells, large scale production, Site directed mutagenesis, high throughput screening tools, Rational protein design and directed enzyme evolution,		Chalk & Board	
2	November 5 th Week	IV	Top 7 (Kuhlman <i>et.al</i>), Altering kinetics, pH, specific activity, increasing stability, pegylated interferon, macro modifications		Chalk & Board	
3	December 1 st Week	IV	Natural and recombinant fusion protein, tags for protein purification.		Chalk & Board	
4	December 2 nd Week	IV	Methods of drug design & delivery.		PPT	Multiple choice questions
5	December 3 rd Week	III	Animal Biotechnology: Development, maintenance and establishment of animal cell culture,		Chalk & Board	
6	December 4 th Week	III	Production of viral vaccines, IFN, tPA, high value therapeutics, urokinase, Cloning in mammalian and non- mammalian cells.		Chalk & Board	
7	January 1 st Week	III	Monoclonal antibodies, chimeric antibodies, immunotoxins as therapeutics.		Chalk & Board	
8	January 2 nd week	III	Gene knockout, transgenic animals and application, human gene therapy, humanized animals as organ farm.		Chalk & Board	
9	January 3 rd week	II	Plant Biotechnology: Plant cell culture, callus, protoplast fusion, differentiation to plantlets,		PPT	

			plant vectors- Ti plasmid			
10	January 4 th week	II	GM food and crops, terminator technology, anti- sense RNA, plantibodies.		PPT and Chalk & Board	
11	January 5 th week	II	Case studies of Bt cotton, Bt corn, Zeneca tomato paste.		PPT and Chalk & Board	
12	February 1 st week	II I	Case studies on Flavr savr tomato, virus resistant plants, roundup ready, golden rice. Microbial Biotechnology: Large scale cultivation of microbes, fermenter design, downstream processing, production of biomass, SCP.		Chalk & Board and PPT	Google classroom
13	February 2 nd week	I	Production of HFCS, cheese, low molecular weight compounds.		Chalk & Board	
14	February 3 rd week	I	Production of human insulin, interferon, human growth hormone, tPA, polysaccharides (xanthan gum, gellan, pullulan etc).		Chalk & Board	
15	February 4 th week	I	Microbial mining, Superbug, microbial degradation of oil - bioremediation of oil spills.		PPT and Chalk & Board	Multiple choice questions
16	March 1 st week	I	Enzymes for research and insecticides		Chalk & Board	
<p>Learning outcomes: Students will gain knowledge of basic protocols in the production of biotechnological products and apply this knowledge to work in industries involving downstream processing that are involved in the production of high value therapeutics.</p>						



Signature of the Faculty



Signature of the HOD

**Academic organizer
(2018-19)
M.SC I YEAR**

**Semester IV, P-IV
Microbiology
Name of the lecturer: M.Usha**

Month & no of teaching days	Unit	Name of the topic
November (3)	Unit I Fundamental Microbiology	Classification of bacteria, morphological types, distribution in nature.
December (6 + 2 extra)	Unit I	Isolation methods: Pure culture techniques & enriched cultures. Motility in bacteria. Staining methods (Gram's staining acid-fast & spore staining). Sterilization methods: Autoclaving, dry heat, filtration; Chemical disinfectants, and irradiation by gamma rays. Growth Media: Supplemented media, Selective media & minimal salts media. Maintenance and preservation of microbial cultures.
January (8 + 2 extra)	Unit I Unit II Viruses	Bacterial Growth: Growth curve doubling time. Factors affecting growth (pH, temperature, oxygen & agitation). Chemostat, continuous & synchronous cultures. Discovery and general characteristics of viruses. Structure & composition of TMV, Cauliflower mosaic virus. One-step growth, single burst & eclipse experiments. General features of host-virus interactions- permissive and non-permissive hosts.
February (8)	Unit II	Lytic versus lysogenic life cycles of λ Phage. Assay methods (Plaque assay, Pock assay, heme agglutination assay, transformation assay). Purification methods (ultrafiltration, ultracentrifugation & affinity methods). Cultivation of viruses in animals & tissue culture. Life cycles of animal viruses (Poliovirus, Retroviruses (RSV/ HIV).
March (1)	Unit II	Virusoids, viroids & prions.

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Department of Biochemistry
Academic Organiser (2018-19)
M.Sc Biochemistry

Semester IV

Skill enhancement course (SEC): Seminar

Schedule for student seminars

S.NO	Month	Date	Day	Names of the students
1	December	13 th	Thursday	J.Gunapriya, K.Geetha Lakshmi
2		20 th	Thursday	Niharika, Priyanka, Swarupa
3		27 th	Thursday	B.Priyanka, M.Sravani, J.Sravani
4	January	3 rd	Thursday	K.Haripriya, Aishwarya, Ch.Mounica
5		17 th	Thursday	Ch.Himantha, A.Anusha, Nikita
6		25 th	Thursday	P.Omkar, A.Mounika, M.Snigdha
7.	February	7 th	Thursday	I.Honey, R.Mounika



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**Academic organizer
(2018-19)
MBA II YEAR (CBCS)**

Semester – IV (A and B Section)

Interdisciplinary Course (IDC): Nutrition & Diet Planning

Name of the lecturer: Prity Mishra

Month & no of teaching days	Unit	Name of the topic
November 6 (2 extra)	Unit I Introduction to Nutrition	Food as source of nutrients, functions of food. Relationship between food, nutrition and health, Basic food groups and food pyramid. BMI (Body mass index) and nutritional status. Glycemic index
December 5 (2 extra)	Unit I Introduction to Nutrition	Nutritive value of Foods: Cereals, Legumes, Nuts and Oil. seeds. Nutritive value of Foods: Milk and milk products, Egg and egg products, Meat, fish, vegetables and fruits. Role of fiber in human nutrition. Anti-nutritive factors, Trans fatty acids in food substances. Common approved food additives, Food allergens.
January 6 (2 extra)	Unit II Nutrition in health and disease	Nutrition - Fitness, Athletics & Sports. Diet Plans for individual's daily food intake in health conditions of anemia and hypertension. Diet Plans for individual's daily food intake in health conditions of cardiovascular diseases and diabetes
February 6 (1 extra)	Unit II Nutrition in health and disease	Diet plan in pregnancy and lactation, Diet plan for child health, Calculation of calorific and nutritive value of foods, Food sanitation and hygiene, Common Food adulterants, Food Laws and standards. Good cooking practices for preserving nutritive value of foods.

A. Sai Reddy

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