



MONTESSORI MAHILA KALASALA

U. G. SECTION

A College with Potential for Excellence

PUNNAMMATHOTA :: VIJAYAWADA -10

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YEAR	SEMESTER	PAPER TITLE	MARKS	CREDITS
II	MBT – II	MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY	100	
	MBP – II	MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY	50	
IV	MBT - IV	INDUSTRIAL MICROBIOLOGY	100	
	MBT - IV	INDUSTRIAL MICROBIOLOGY	50	
	MBT -V	MOLECULAR BIOLOGY AND MICROBIAL GENETICS	100	
	MBT -V	MOLECULAR BIOLOGY AND MICROBIAL GENETICS	50	
VI	MBT-701	MOLECULAR VIROLOGY	100	
	MBT-701	MOLECULAR VIROLOGY	50	



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B.Sc MICROBIOLOGY (CBCS) REVISED SYLLABUS -2020

MBT – II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

TOTAL HOURS: 48

CREDITS: 4

UNIT-I: No. of hours: 8

Carbohydrates – Classification, chemistry, properties, and function– mono, di, oligo and polysaccharides.
Lipids – classification, chemistry, properties and function – free fatty acids, triglycerides, phospholipids, glycolipids & waxes

UNIT-II: No. of hours: 10

Amino acids – classification, structure and function. Essential amino acids & amphoteric nature of amino acids and reactions and functions of carboxyl and amino groups and side chains. Proteins– isolation and characterization of proteins. Structural levels of proteins– primary, secondary, tertiary and quaternary, denaturation of proteins. Hydrolysis of proteins. Outlines of Protein sequencing using various methods.

UNIT – III: No. of hours: 10

Nucleic acids–structure, function and their properties. Types of DNA, RNA. Chemical structure and base composition of nucleic acids, Chargaff's rules, Watson Crick Model (B-DNA), deviations from Watson-Crick model, other forms of DNA (A and Z-DNA), forces stabilizing nucleic acid structures, (hydrogen bonds and hydrophobic associations, base stacking). Structural characteristics of RNA. Types of RNA.

UNIT- IV No. of hours: 10

Properties and classification of Enzymes. Biocatalysis- induced fit and lock and key models. Coenzymes and Cofactors. Factors affecting catalytic activity. Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric. Enzyme kinetics: Michaelis-Menten equation, effect of substrate concentration, effect of enzyme concentration, effect of p H and temperature, temperature.

UNIT – V: No. of hours: 10

Aerobic respiration - Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation. Kreb's cycle, glyoxylate cycle, hexose monophosphate (HMP) shunt, gluconeogenesis. Anaerobic respiration Fermentation, Biochemical mechanisms of lactic acid, ethanol fermentations. Nitrate and sulphate respiration. Outlines of oxygenic and anoxygenic photosynthesis in bacteria.



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MBT – IV INDUSTRIAL MICROBIOLOGY

UNIT – I No. of hours: 7

Microorganisms of industrial importance – bacteria, yeasts, moulds and actinomycetes. Types of microbial metabolites. Screening and strain improvement techniques of industrially important metabolites microbes.

UNIT – II No.of hours: 10

Fermentation and fermenter: concept and discovery of fermentation. Fermenter: its parts and function. Types of fermenter – batch, continuous and fed batch. Types of fermentation processes – solid state, liquid state, batch, fed-batch, continuous. Ingredients of Fermentation media (composition and types). Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.

UNIT – III No.of hours: 8

Microorganisms involved in Pharma and therapeutic enzymes. Industrially important Enzymes (detergents, textiles and leather industries). Production of amylases and Proteases. Production of therapeutic enzymes.

UNIT – IV No.of hours: 7

Industrial microorganisms: principles of production media. Microbial production of Industrial products: Citric acid, Ethanol, Penicillin, Glutamic acid, and vitamin B12.

UNIT – V No.of hours:7

Bioreactors: basic structure of bioreactor, types of bioreactors, kinetics and methodology of batch and continuous bioreactors. Sterilization of bioreactors: fibrous filter sterilization. Aeration and agitation: agitation in shake flask and tube rollers.



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MBT – V: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

TOTAL HOURS: 48

CREDITS: 4

UNIT- I No. of hours: 8

DNA and RNA as genetic material. Structure and organization of prokaryotic DNA. Watson and Crick model of DNA. Extra chromosomal genetic elements - Plasmids and transposons. Replication of DNA - Semi conservative mechanism, Enzymes involved in replication.

UNIT- II No. of hours: 10

Mutations - spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions. Mutagens - Physical and Chemical mutagens. Outlines of DNA damage and repair mechanisms. Genetic recombination in bacteria - Conjugation, Transformation and Transduction.

UNIT- III No. of hours: 10

Concept of gene. Muton, Recon and Cistron. One gene one enzyme and one gene one polypeptide hypotheses. Bacterial recombination – Bacterial transformation, Bacterial conjugation, Transduction– Generalized and specialized transductions.

UNIT- IV No. of hours: 8

Transcription E.coli RNA polymerase, Mechanism of transcription, Classes of RNA molecules, processing of tRNA and rRNA in E.coli, Transcription in Eukaryotes: RNA Polymerases of eukaryotes. Differences between Pro and eukaryotic transcription, Post transcriptional modifications Translation: Ribosomes, Genetic Code, Protein Synthesis, Inhibitors of protein synthesis.

UNIT- V No. of hours: 10

Regulation of gene expression in bacteria - operon concepts - Negative and positive control of the Lac Operon, trp operon. Poly and Mono cistronic m-RNA.



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B.Sc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR –Semester –VI

MBT- 701 Molecular Virology

UNIT-1

History of virology and biosafety: history and principles of virology . structures of animal and plant viruses and their morphology. Principles of biosafety and requirements of virology laboratory.

UNIT -2

Virus replication: structure and replication strategies of bacteriophages- ϕ 7, λ , and plant viruses-ss RNA virus (TMV) and ds DNA virus (CaMV), Structure and replication strategies of animal viruses , Adeno virus and retero virus.

UNIT -3

Interferon and antiviral agents : viral interference and interferons.Nature and source of interferons ,Classification of interferons. Induction of interferon . Antiviral agents (chemical and biological)and their mode of actions.

UNIT-4

Cultivation of Viruses and viral vaccines : cultivation of viruses in embryonated egg. Conventional vaccines- killed and attenuated Modern vaccines – Recombinant proteins, subunits , DNA vaccines ,peptides, immunomodulators (cytokines). Vaccine delivery and adjuvants , large –scale manufacturing.

UNIT -5

Virological Methods: Methods for purification of viruses with special emphasis on ultracentrifugation methods . quantitative diagnostic methods – Haemagglutination , complement fixation, neutralization ,western blot. Nucleic acid based diagnosis –PCR, Microarray and nucleotide sequencing.



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B.Sc NANOTECHNOLOGY(CBCS)SYLLABUS

THIRD YEAR-SEMESTER-VI

NTT-602:FABRICATION OF THIN FILMS

UNIT-1

Vacuum Technology:Clean Room-Clean Room technology and its classes.Principles of vacuum pumps in range of 10-12 torr to 10-11 torr,principle of different vacuum pumps: root pump, rotary, oil diffusion pump,turbo molecular pump,ion pump,Tisublimation pump,importance of measurement of vacuum.

UNIT-II

Condition for the formation of thin films:Environment for thin films deposition,deposition parameters and their effects on film growth,formation of thin films(sticking coefficient,formation of thermodynamically stable cluster-theory of nucleation)

UNIT-III

Physical vapour deposition techniques;Thermal evaporation,resistive evaporation ,electron beam evaporation,aster ablation,flash and cathodic are deposition.

UNIT-IV

Electrical discharges used in thin film deposition:sputtering,Glow discharges puttering,magnetron sputtering,Ion beam sputtering,R.F. sputtering,Triode sputtering,Ion plating,difference between thin films and coating.

UNIT-V

Electron deposition,molecular beam epitaxy,and laser pyrolysis,chemical vapour deposition techniques,Advantages and disadvantages of chemical vapour deposition techniques over PVD techniques,relation types,boundaries and flow.