Syllabus
FIRST SEMESTER
UNIT I
Carbohydrates: Classification, function and properties of mono, di, oligo, homo and heteropolysaccharides. Properties and functions of glycolipid, glycoprotein, chemical structure and properties of starch, cellulose, hemicellulose and glycogen. Lipids: Classification and properties of saturated and unsaturated fatty acids, complex lipids and sterols in microbial system. Amino acids and proteins: Classification of amino acids, Peptide bonds, classification and functions of proteins. Protein sequencing. Nucleic acids: purines and pyrimidines, Phosphodiester linkage, Structure of DNA, Higher order structure of DNA, chromatin structure, nucleosome, histones, RNA- types, structure and functions.

UNIT II

UNIT III
Energy production in bacteria – energy and ATP, aerobic and anaerobic respiration, glycolysis, tricarboxylic acid cycle, electron transport and oxidative phosphorylation, phosphoketolase pathway, pentose phosphate pathway, gluconeogenesis and glyoxylate cycle.

UNIT IV

UNIT V
Photosynthetic bacteria and cyanobacteria- pigments of photosynthetic apparatus, mechanism of photosynthesis in bacteria.
REFERENCES:-


MB102 - Biophysics, Instrumentation And Biostatistics

UNIT I
Laws of conservation of energy-first and second laws and their relevance in the biological system, entropy, enthalpy, thermodynamic equilibrium, redox potential, Gibb’s free energy, bioenergetics –endothermic and exothermic reactions of biological systems, energy change in the biological reactions. Electrical properties of biological compartments. Electricity as a potential signal, electrochemical gradients, membrane potential, ATP synthesis, chemiosmotic hypothesis.

UNIT II
Protein structure-primary, secondary, tertiary and quaternary structures, forces stabilizing, denaturation kinetics, torsion angle, protein – ligand interactions, Ramachandran plot. Nucleic acids- DNA structure and polymorphism. DNA supercoiling. DNA-protein interaction, RNA-protein interaction.

UNIT III
Microscopy, Principles of microscopy, various types of microscopy – simple microscope, phase contrast microscope, fluorescent microscope, electron microscope, polarization, confocal and interference microscopy, CCD camera, Introduction to Atomic force microscopy. Basic principles and working of instruments, pH meter, spectrophotometer (UV and visible), Beer-Lambert’s law, flame photometry, colorimeter. Brief account of densitometry, fluorimetry, manometry, atomic absorption spectroscopy, IR, NMR, X – ray crystallography, flow cytometry and GM counter.

UNIT IV

UNIT V
and their applications in biology. Tests of hypotheses- Some basic concepts, errors in hypotheses testing, critical region, students t – test for the significance of population mean, chi square test for population variance, F- test for the equality of two population variance. Analysis of variance – one way and two way analysis.

REFERENCES:
3. A text of Biophysics , R.N Roy.
MB103 - Cell and Molecular Biology and Bioinformatics

UNIT I

UNIT II
DNA Replication – Process of DNA replication and models of DNA replication, Initiation of DNA replication, Unwinding of DNA, Elongation, Role of Topoisomerase, Gyrase, SSB, Helicase, Ligase and Primasome. DNA polymerases in eukaryotes and prokaryotes, Klenow fragment, Okazaki fragments, Process at DNA replication fork, Assembly of lagging strand fragments, termination of replication, modes of replication, theta, rolling circle, d-loop replication, Inhibition of replication.

UNIT III
Transcription - RNA polymerases in prokaryotes and eukaryotes, Transcription signals, Promoters and Enhancers, Initiation and Elongation of RNA synthesis, Rho dependent and Rho independent termination, Transcription factors in Eukaryotes, Prokaryotic and Eukaryotic Transcription, post transcriptional modifications, Splicing-Spliceosome, lariat structure, Group 1, II and III Introns, Ribozyme, RNase P, RNAse III, RNAse H. Trans-splicing, alternate splicing, RNA Editing, Guide RNA, inhibitors of transcription.

UNIT IV

UNIT V
Introduction to bioinformatics and Data Mining, Biological databases and search tools, DNA and RNA sequence databases, genomic databases, protein sequence databases, structural databases, derived and specialized databases, Sequence analysis, pairwise and multiple
alignments, sequence analysis softwares, Phylogenetic analysis- methods, Protein structure prediction, structural alignment methods, homology modeling and molecular docking.

REFERENCES:

1. Benjamin Lewin (2013) *Genes IX*. Jones and Bartlett publishers


MB104 - LAB – 1: Microbial Biochemistry and Bioinformatics

PART I – MICROBIAL BIOCHEMISTRY

2. Separation and identification of amino acids by paper chromatography and Thin Layer Chromatography.
3. Separations of proteins by SDS - PAGE.
5. Estimation of glycogen in a bacterial cell.
8. Estimation of amino acid content in a bacterial cell using colorimetric method.
12. Effect of temperature on enzyme activity.

PART II - BIOINFORMATICS

1. Analysis of Nucleic Acid Sequences
2. Sequence Similarity Searching
3. ORF Prediction
4. Multiple sequence Alignment
5. Molecular Phylogeny
6. Gene Structure and Function prediction
7. Protein structure analysis

REFERENCES:


MB105 - Industrial Visit
SECOND SEMESTER
MB201- GENERAL MICROBIOLOGY

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V
REFERENCES


MB202 - Immunology and Immunotechniques

UNIT I

UNIT II

UNIT III
Receptors on T and B cells for antigens, Organization and Rearrangement of TCR genes, T-cell accessory membrane molecules, Co-stimulatory signal, Clonal anergy, Signaling pathways by activation of TCR, ITAM, T-cell maturation, activation and differentiation, Cell mediated Immune response, B cell- generation, activation, differentiation, B-cell coreceptor complex, Humoral Immune response, Primary and secondary immune response, Clonal selection theory. Cytokines, MHC, HLA typing, MHC-restriction, Antigen processing and presentation, Complement system, Complement activation, Classical, Alternative and Lectin complement pathway, regulation of complement activation, Biological effects of complements.

UNIT IV
Immunology of organ and tissue transplantation, types of grafts, Allograft reaction and GVH reaction, Histocompatibility testing, Immunosuppression, Factors influencing allograft survival, Immunology of malignancy- Tumor antigens, TATA, TSTA, Immune response in malignancy, Mechanisms of immune evasion by tumors, Immunotherapy of cancer, LAK cells, TILs, Immunohematology- ABO and Rh blood group system, Immunology of blood transfusion, Hemolytic disease of new born.
UNIT V
Immunological Tolerance, Autoimmunity- Mechanisms of autoimmunity, Classification of Autoimmune diseases. Hypersensitivity- immediate and delayed reactions, Types of hypersensitivity reactions and their features, Immunodeficiency diseases- primary immunodeficiency and secondary immunodeficiency disease, Immunoprophylaxis, Vaccines –types of vaccines, DNA vaccine and recent trends in vaccine development, Routine immunization schedules

REFERENCES


5. Kuby Immunology, Sixth Edition


MB203 - Recombinant DNA Technology

UNIT I
History of recombinant DNA technology, Purification of DNA from living cells, Enzymes used for in vitro DNA manipulation and their mechanism of action. DNA polymerases, Restriction Endonucleases, Kinases, Phosphatases, Ligases, Terminal Transferases, Functions and applications of Adapters and Linkers and Homopolymer Tailing. Reverse transcription and cDNA synthesis.

UNIT II
Plasmids - desirable properties of plasmid cloning vectors, Construction of prototype vector pBR322, Vectors derived from pBR322, Bacteriophages λ- Replication of phage λ DNA in lytic and lysogenic cycles, structure of bacteriophage λ cloning vectors EMBL3 and EMBL4, Packaging phage λ DNA in vitro, M13 vectors, Cosmid vector - scheme for cloning in a cosmid vector, Phagemids, BAC, PAC, Shuttle Vectors, Ti plasmid and Binary vector system, Expression vectors, Promoters, and reporter systems, Prokayotic expression system, Fusion tagged expression system, Purification of recombinant proteins. Strategy for regulating the expression of genes cloned into a pET vector, Vectors for Yeast expression, Yeast two hybrid system, Mammalian Expression vectors.

UNIT III
Techniques used in recombinant DNA research, Blotting techniques -southern, northern and western, chromosome walking, chromosome jumping. PCR - principle and types, Chemical synthesis of DNA, DNA sequencing methods, Sangers dideoxy sequencing. Next Generation and Advanced sequencing technologies, pyrosequencing. Changing genes - site-directed Mutagenesis, SDM- methods, Overview of various steps involved in cloning, Construction, Screening and applications of genomic DNA and cDNA library. Cloning of full length cDNA, RACE, Subtraction cloning, differential mRNA display technique

UNIT IV
Bacterial transformation, Selection of recombinants, Blue white screening, Antibiotic resistance selection, Introduction to animal cell culture, Gene transfer to animal cells, Genetic manipulation of mammals, Introduction to plant tissue culture, Gene transfer to plant cells – Electroporation and Biolistics, Agrobacterium mediated transformation, Advances in transgenic technology, Inducible expression system, Recombinant inducible systems.

UNIT V
Applications of recombinant DNA technology, Nucleic acid sequences as diagnostic tools, New drugs and new therapies for genetic diseases, Gene therapy, Recombinant vaccines and hormones, Imparting new agronomic traits to plants – resistance to abiotic and biotic stress, improving quality and quantity. Golden rice, edible vaccine, Improving therapeutic proteins
with single amino acid changes, Protein engineering, Metabolic engineering, biosynthesis of indigo in *E. coli*, Combinatorial biosynthesis, Gene Silencing, RNA interference, antisense therapy, Gene Knockout.

REFERENCE: -

MB204 - LAB 2: General Microbiology, Immunology and Recombinant DNA Technology

PART I - GENERAL MICROBIOLOGY
1. Cleaning and sterilization of glass wares.
2. Preparation of solid and liquid media and their sterilization.
3. Uses and study of microscopes.
5. Bacterial cell counting by haemocytometer.
6. Staining of bacteria
   i) Simple staining.
   ii) Gram staining.
   iii) Negative staining.
   iv) Capsule staining
   v) Endospore staining.
   vi) Acid – fast staining.
7. Microscopic test for bacterial motility by hanging drop method.
9. Cultivation of bacteria
   i) Pour plate method.
   ii) Spread plate method.
   iii) Streak plate method.
   iv) Anaerobic culture method
10. Study of cultural characteristics of bacteria and biochemical reaction of bacteria
11. Antibiotic sensitivity tests- disc diffusion, MIC
12. Bacterial growth curve
15. Isolation of fungi using suitable media.
16. Identification of fungi by lactophenol cotton blue mounting and study of the cultural characteristics of various fungi.

PART II - IMMUNOLOGY
1. Diagnosis for in vitro detection of CRP qualitative latex slide test.
2. RPR card test for syphilis.
3. WIDAL test.
4. ASO Latex agglutination test.
5. RA Latex agglutination test.
6. ELISA test
7. Determination of blood group and Rh factor.
8. Pregnancy testing using the immunological methods.
PART III - RECOMBINANT DNA TECHNOLOGY

1. PAGE- Protein separation
2. DNA and RNA isolation from different sources
3. Estimation of DNA and RNA
4. Agarose gel electrophoresis of nucleic acids
5. Bacterial transformation and blue white screening
6. Plasmid isolation
7. Restriction enzyme digestion
8. Polymerase Chain Reaction

References

2. Cambridge University Press. 2nd ed.
5. Gradwohl RBH, Sonnenwirth AC, & Jarett L (1980) Gradwohl's Clinical Laboratory
6. Methods and Diagnosis .Mosby, St Louis, Mo. ; London. 8th ed
THIRD SEMESTER
MB301 - Environmental and Agricultural Microbiology

UNIT I
Aerobiology, Microbial contamination of air, Sources of contamination, Microbial indicators of air pollution. Enumeration of bacteria in air, Air sampling devices. Air sanitation. Effect of Air Pollution on plants and humans.

UNIT II
Aquatic microbiology: Microbiology of water, Water pollution and water borne pathogens, Bacteriological examination of water, Indicator organisms. Purification and disinfection of water Microbiology of sewage, Waste water treatment, BOD, COD. Role of microbes in marine fouling

UNIT III
Microbial flora of soil and factors affecting them, Key processes and role of microorganisms in Nitrogen, Carbon, Phosphorus, Sulphur and Iron cycles.

UNIT IV

UNIT V
Recycling of liquid and soil wastes – Composting – Biogas – Biodegradation. Bioremediation, Bioleaching, Xenobiotic degradation. Microbial corrosion- Biofilms degradation of petroleum products. Microbes in mineral leaching and metal concentration, Microbial enhanced oil recovery

References:


MB302 - Food and Dairy Microbiology

UNIT I:
Microorganisms associated with food, Factors affecting the microbial growth in food – intrinsic, extrinsic, implicit and processing factors. Hurdle effect, Food contamination and spoilage. Microbial spoilage of cereals, poultry, fish, meat, egg, stored grains fruits and vegetables. Spoilage of canned foods. Microbiological examination of food.

UNIT II
Food preservation, physical and chemical methods. Natural food preservatives, Developments in the history of fermented foods, Nutritional value of fermented foods. Lactic acid bacteria, Genera of lactic acid bacteria and their properties, Homofermentative and Heterofermentative LAB, Heterolactic end products from pyruvate metabolism. Sugar Transport by Lactic Acid Bacteria, Proteolytic system in lactococci, Yeasts and mold used in manufacture of fermented food, Starter cultures used for fermented food and their properties. Fermented food products- making of pickles, fermented vegetables, Changes in microbial population during vegetable fermentation, Fermentation succession during sauerkraut fermentation, Traditional fermented foods.

UNIT III
Composition of milk, Pasteurization, Preservation of milk. Microbial examination of milk, Role of microbes and microbial enzymes in the manufacture of dairy products, Organisms used as starter culture in the manufacture of fermented dairy products, Yogurt Manufacture, Nutritional Benefits of Yogurt, sour cream, kefir, traditional and modern manufacturing of kefir, manufacture of cultured buttermilk, Cheese, General steps in cheese making, Cheese-types, Microbial contamination of milk

UNIT IV
Food borne infections and intoxications, bacterial and non-bacterial, pathogenesis, clinical features, isolation, identification and association with food, Mycotoxins and mycotic poisoning, Prevention measures, Food control agencies and their regulations. Laboratory testing of foodborne outbreaks, Indicator organisms.

UNIT V
Production of edible mushrooms, Importance of Bifidobacterium. Nisin and its applications, SCP, Probiotics- health benefit and mechanism of action, prebiotics, and synbiotics. Hazard analysis and clinical control point system.
REFERENCES


MB303 - Industrial Microbiology

UNIT I
Historical account of microbes in industrial microbiology, Sources and characters of industrially potent microbes. Isolation, purification and preservation of industrially useful microbes, Screening methods and methods for strain improvement.

UNIT II
Microbial growth kinetics, Batch, continuous and fedbatch culture, Monod’s model and deviations from Monod’s model. Batch culture - specific growth rate, substrate saturation constant, yield coefficient, substrate affinity. Continuous culture- Dilution rate and Washing out. Applications and examples of fedbatch and continuous system, comparison between various cultivation systems

UNIT III
Industrial fermentations. Types of fermentations. Components of fermentation process, Media for industrial fermentation, sterilization, inoculum preparation, raw materials used in industrial fermentation media, antifoam agents, Solid substrate fermentation (SSF) - Principles and application, Submerged Fermentation. Aerobic and anaerobic fermentation, Problems in fermentation process and handling.

UNIT IV
Fermentor – parts, design, construction and types, Pneumatically driven, hydrolytically driven, mechanically driven, CSTR, Airlift, Packed Bed, Fluidized Bed, cyclone, cylin dro conical fermentors, Monitoring and control of fermentors, Control of physical and chemical conditions, online and off line instrumentation, pH, temperature, DO probes. Methods used for down-stream processing and product recovery- filtration, centrifugation, celldisruption, extraction, dialysis, Purification, Drying, Packing and labeling. Good Manufacturing Practices, Fermentation economics.

UNIT V

REFERENCES
New Age International


MB304 - LAB - 3 Environmental, Agriculture, Food, Dairy and Industrial Microbiology

PART I - Environmental Microbiology
1. Isolation of microorganisms from different sources – air and water.
2. Analysis of water
3. Sample for total bacterial population by SPC.
4. Analysis of water samples – Biological parameters.
   i) Determination of dissolved oxygen.
   ii) Determination of BOD.
   iii) Determination of COD.
   iv) Bacteriological examination of water by - SPC, Presumptive, Confirmed and Complete test etc. (potability of water sample).
   i) Tests for coliforms by membrane filter technique.
   ii) IMViC tests for the identification of coliforms.

PART II - Agriculture Microbiology
1. Isolation of microorganisms from soil (bacteria and fungi).
2. Isolation of microbes from crops infected with bacterial diseases and fungal diseases.
3. Isolation and identification of Rhizobium from root nodules.
4. Isolation of Azotobacter from rhizosphere soil.
5. Isolation of Azospirrilum from soil.
6. Isolation of Phosphobacteria from soil.
7. Isolation of blue green algae and their microscopic observation.
8. Microscopic examination of VAM infection.

PART III - Food and Dairy Microbiology
1. Microbiological examination of foods.
   i) Isolation and enumeration of bacteria and fungi from fresh and spoiled fruits.
   ii) Isolation and enumeration of bacteria and fungi from fresh and spoiled vegetables.
   iii) Isolation and enumeration of bacteria from fruit juices.
2. Detection of bacteria in spoiled tinned food.
3. Food preservation.
   i) Pickle preparation.
   ii) Squash preparation.
   iii) Jam preparation.
4. Effect of food preservatives on the growth of microbes.
5. Isolation of Aspergillus flavus from spoiled food.
6. Analysis of mycotoxin (aflatoxin) in fungus contaminated food materials.
PART IV Industrial Microbiology
2. Determination of quality of milk sample.
   i) Methylene Blue Reduction Test.
   ii) Resazurin Test.
3. Alkaline phosphatase testing of raw and pasteurized milk
4. Microbial production of curd.
5. Solid state and submerged fermentation
6. Production of wine from grapes.
7. Fermentation of yeast and quantitative estimation of ethanol produced during yeast fermentation.
8. Amylase production by bacteria and fungus.
9. Citric acid production.
10. Cultivation of edible mushroom.

REFERENCE:
MB305 - Electives

EXTREMOPHILES

UNIT I

Microbial Diversity in extreme environment. Peculiar features of Archaea compared to bacteria. Identification of microbes in extreme environment.

UNIT II

Thermophiles-classes, extremely thermophilic archaebacteria, thermozyymes, psychrophiles-psychrophilic archael extremozymes, Molecular adaptation of extremophiles. Protein stability in extremophilic microbes.

UNIT III

Halophiles-osmoregulation, cellular adaptation, structural adaptation, molecular adaptation. Xerophiles. Radiation resistant bacteria-Deinococcus radiodurans

UNIT IV

Biotechnological applications of archaea. Bioelectronics from lipids of archaea. Space microbiology-introduction. Panspermia-definition,mechanisms proposed. Microbiological research in space environment.

References :


MARINE MICROBIOLOGY

UNIT I

UNIT II

UNIT III

UNIT IV
Marine natural products, bioactive compounds from marine microorganisms, marine biosensor. Biosurfactants, biopolymers and novel enzymes from marine organisms.

References
PHARMACEUTICAL MICROBIOLOGY

UNIT I

History; contributions of Paul Ehrlich, Edward Jenner, Alexander Fleming. Bioactive molecules – extraction, purification and characterization; safety profile, toxicological evaluation of drugs, mutagenicity, carcinogenicity and teratogenicity. Drug interactions and drug metabolism.

UNIT II

Introduction of medicines in market- role of FDA clinical trials- objectives, conduct and outcome; drug delivery systems

UNIT III

Different types of antibiotics; mechanism of action of antibiotics; assay of antibiotics- penicillin; vaccines – active and passive immunization; conventional bacterial and viral vaccines

UNIT IV

Pharmacognosy – brief introduction. Significance in Indian systems of medicine- Siddha, ayurveda and unani. Active principles and medicinal uses of the following- Adathoda vasica, Rauolfia serpentina, Curcuma longa, Ocimum sanctum, Coleus aromaticus and Phyllanthus niruri. Antimicrobial activity testing of herbal extracts.

References


12. National Committee for Clinical Laboratory Standards (now Clinical and Laboratory Standards Institute, CLSI). *Performance standards for antimicrobial susceptibility testing; 12th information supplement (M100-S1)*. Villanova, PA; NCCLS: 2002


BIOINFORMATICS

UNIT I

General introduction (characteristics, capabilities and generations of computers). Software and hardware, Basic Structure of a computer (memory unit, control unit, arithmetic and logic unit), input devices, output devices, Types of software (system software, application software), languages - (low level, intermediate level and high level). Number systems, Truth Table (basic operations like AND, OR, NOT), Binary addition, subtraction, flow chart. Basics of MS Word, MS Excel and MS Power point. Basics of operating systems, Necessity of Operating System, Functions of an operating system, Types of operating systems - Batch Systems, Time Sharing Systems, Real Time Systems, Basic Structure of an Operating System, User Interface, Types of User Interface (CUI, GUI). Introduction to networking (LAN, WAN, MAN), Network Topology, Internet, web servers, application of networking, WiFi, Bluetooth, WLAN, down loading files with anonymous FTP, Gopher and Mosaic.

UNIT – II


UNIT – III

Tools (software) in bioinformatics. Tools of sequence alignments – BLAST (nucleotide, protein) FASTA, Clustal X and RASMOL. Phylogenetic analysis, construction of phylogenetic tree, prediction of evolutionary changes in nucleotide and protein sequences, structure prediction, structural alignment tools, homology modeling, drug design. A short introduction to genome analysis, genome sequencing projects, genome similarity.

UNIT – IV

Applications of bioinformatics- pharmaceutical industry, immunology, agriculture, forestry, basic research, cheminformatics in biology, geoinformatics, legal ethical and commercial considerations. Internet resources for bioinformatics – websites (NCBI, EBI, DDBJ).

Reference

2. Baxevaris, A.D. *Bioinformatics* B.F Publication


FOURTH SEMESTER
MB401 - Medical Bacteriology

UNIT I
History of Medical Microbiology, Infections - Sources and classification, Mode of transmission of infections, Types of infectious diseases, Factors predisposing to microbial pathogenicity. Normal microflora of human body, Human Microbiome, Human Microbiome Project.

UNIT II
General characters, pathogenicity, epidemiology and laboratory identification of *Staphylococci*, *Streptococci* and *Neisseriae*, *Corynebacterium*, *Bacillus*, and *Clostridia*

UNIT III
General properties, morphological and cultural characters, pathogenicity, epidemiology and laboratory identification of *E.coli*, *Proteus*, *Klebsiella*, *Shigella*, *Salmonella*, *Pseudomonas*, *Haemophilus*, *Pasteurella*, *Yersinia*, *Francisella*, *Bordetella*, *Brucella* and *Vibrio*.

UNIT IV
Identifying characters, morphological and cultural features, pathogenicity, epidemiology and laboratory identification of Spirochetes, Mycoplasma, Rickettsiae, Chlamydiae, *M.tuberculosis*, *M.leprae*, and Non tuberculous mycobacteria.

UNIT V
Study of important properties and clinical importance of Actinomycetes- *Nocardia*, *Actinomyces*, General characters and clinical importance of *Listeria*, *Campylobacter*, *Helicobacter*, *Legionella*, *Acinetobacter*

References


MB402 - Medical Virology, Mycology and Parasitology

UNIT I:

UNIT II
General properties, clinical importance, pathogenesis and laboratory diagnosis of diseases caused by Picorna, Orthomyxo, Paramyxo, Rhabdo, and Rubella viruses. General characters, clinical importance, pathogenesis and laboratory diagnosis of diseases caused by Arboviruses and Hepatitis viruses, SARS and HIV.

UNIT III

UNIT IV

UNIT V
Life cycle and pathogenesis of important Protozoan diseases- Entamoeabosis, Malaria, Trypanosomiasis and Lieshmaniasis. Clinical importance of Giardia, Trichomonas, Toxoplasma, Cryptosporidium and Pneumocystis.

References


MB403 - Clinical and Diagnostic Microbiology

UNIT I
Microbiology Laboratory Safety - General Safety Principles, Handling of Biologic Hazards, Disposal of Infectious waste, Biomedical waste management, infection control practice, emerging and reemerging infections.

UNIT II
Diagnostic cycle, General concept of specimen collection, transport, processing and rejection of clinical specimens. Mailing of biohazardous materials.

UNIT III
Diagnosis of microbial diseases - Clinical, microbiological, immunological and molecular diagnosis of microbial diseases. Modern methods of microbial diagnosis. Automation in Microbiology; Laboratory control of antimicrobial therapy; Immunoprophylaxis

UNIT IV
Normal microbial flora of the human body. Etiological agents and approach to diagnosis of Blood stream infections, Respiratory tract infections, Meningitis, Urinary tract infections, Genital Tract infections, Sexually transmitted diseases, Skin and Soft tissue infections, Nosocomial infections – common types, Sources, reservoir and mode of transmission, and Measures to control

UNIT V
Gastrointestinal Tract infections, Infections of sinuses, eye and ear. bone infections, Pyrexia of unknown origin and Zoonoses. Pyogenic infections. Infections in immunocompromised and immunodeficient patients. Infections in foetus and neonates

References
2. American Society for Microbiology, Bethesda, Md.
6. Wilson's principles of bacteriology, virology and immunology. Edward Arnold,8th ed


MB404 - LAB – 4  Medical Microbiology

PART I - Bacteriology
1. Study of the morphology, staining characters, cultural characters and identification of Staphylococci, E.coli, Klebsiella, Salmonella, Shigella, Proteus, Pseudomonas, Vibrio,
2. Isolation and biochemical identification of bacteria from mixed culture.
3. Study of common laboratory contaminants.

PART II - Mycology
1. Culture methods for isolation and identification of fungi- KOH mount preparation,
2. Lactophenol cotton blue staining, Slide culture technique etc.
3. Gram staining and Germ tube test of Candida albicans

PART III - Virology and Parasitology
1. Cultivation of viruses in embryonated eggs different routes – harvesting
2. Examination of peripheral blood for haemoflagellates and malarial parasites

PART IV - Clinical Microbiology
1. Study of normal microbial flora of human beings
2. Techniques for collection of clinical specimens for microbiological analysis- Macroscopic, microscopic examination of clinical samples. Culture methods identification and antibiotic sensitivity test of isolates

References
MB405 - Dissertation And Viva-Voce