

VIJAYA COLLEGE
R. V. Road, Basavanagudi, Bengaluru – 560004
DEPARTMENT OF MICROBIOLOGY
ACADEMIC PLANNER 2022-23
1ST SEMESTER

Name of the Department: MICROBIOLOGY	Subject Title : General Microbiology	
Semester: I	Paper: MBL 101	
	Portions Planned for 1 hour	Teacher
September 3 rd week	Orientation & Department activities (PPT)	KM
	Bridge course	MS
	Bridge course	KM
September 4 th week	Bridge course (test)	MS
	Syllabus Discussion	KM
	History of Microbiology	KM
September 5 th week	Origin of life	MS
	Origin of life	KM
	History of Microbiology – abiogenesis vs biogenesis	KM
	History of Microbiology – end of the debate	MS
October 1 st week	History of Microbiology – other important landmarks	MS
	Contribution of Scientists to the field of Microbiology (Antony Van Leewenhock)	KM
	Antimicrobial spectrum of Antibiotics	MS
	Contribution of Scientists to the field of Microbiology (Louis Pasture)	KM
October 2 nd week	Contribution of Scientists to the field of Microbiology (Robert Koch)	MS
	Physical and chemical theories of staining	KM
	Contribution of Scientists to the field of Microbiology (Alexander Fleming, Lazzaro Spallanzani)	MS
	Contribution of Scientists to the field of Microbiology (Edward Jenner, Joseph Lister)	KM
October 3 rd week	Stains and Staining Techniques-Nature of Dyes	MS
	Staining Techniques-Simple Staining	KM
October 4 th week	Principles of Microscopy	MS
	Photomicrography.	KM
	Dark field microscopy	MS

November 1 st week	Phase contrast microscopy	KM
	Fluorescence microscopy	KM
	Differential Staining	MS
November 2 nd week	Differential Staining	MS
	Electron Microscopy- TEM	KM
	Electron Microscopy- SEM	KM
	Structural Staining	MS
November 3 rd week	Structural Staining	MS
	Overview of prokaryotic cell structure Size, shape and arrangement of prokaryotic cells	MS
	Overview and ultrastructure of eukaryotic cell structure	KM
	Cell wall and cell membrane	MS
November 4 th week	Components external to cell wall	MS
	Components internal to cell wall	KM
	Structure and functions of organelles	KM
	Bacterial endospore – structure & formation	MS
December 1 st week	Reproduction in bacteria	MS
	Reproduction in fungi	KM
	Sterilization - principles	MS
	Types of sterilization	KM
December 2 nd week	Physical methods	MS
	Chemical methods	KM
	Preservation of microorganisms – principle and types	KM
	Preservation – slant culture, stab culture, soil culture	MS
December 3 rd week	Preservation – oil overlaying, glycerol preservation, lyophilization	MS
	Discussion of old question papers	KM
	Discussion of old question papers	KM
	Revision 1	MS
December 4 th week	Open book writing of University questions and answers	MS
	Class test 1	KM
	Class test 2	KM
	Revision 2	MS

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3rd SEMESTER

Name of the Department: MICROBIOLOGY	Subject Title : Microbial Diversity	
Semester: III	Paper: MBL 103	
	Portions Planned for 1 hour	Teacher
October 3 rd week	Syllabus Discussion	KM
	Basic concepts, Definition and levels of biodiversity	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Archaea	KM
October 4 th week	Biosystematics – classification	MS
	Archaeal type study – Methanogens, <i>Thermus aquaticus</i>	KM
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Bacteria	KM
November 1 st week	Numerical classification & Chemotaxonomy	MS
	Bergey's manual	KM
	Bacterial type study – <i>E. coli</i> , <i>Bacillus</i> , <i>Staphylococcus</i>	KM
	Study & measures of Microbial diversity	MS
November 2 nd week	Conservation & Economic Value of Microbial Diversity	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Cyanobacteria	KM
	General characters, classification & economic importance of fungi.	MS
	Cyanobacteria type study – <i>Nostoc</i> , <i>Microcystis</i> , <i>Spirulina</i>	KM
November 3 rd week	Salient features and reproduction - <i>Rhizopus</i>	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Actinomycetes	KM
	Salient features and reproduction - <i>Saccharomyces</i>	MS
	Actinomycetes type study – <i>Streptomyces</i> , <i>Nocardia</i> ,	KM

	<i>Frankia</i>	
November 4 th week	Salient features and reproduction – Aspergillus, Fusarium	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Rickettsiae – <i>Rickettsia rickettsi</i>	KM
	Salient features and reproduction - <i>Agaricus</i>	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Chlamydiae – <i>Chlamydia trachomatis</i>	KM
December 1 st week	General characters, classification & economic importance of algae	MS
	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Spirochetes – <i>Treponema pallidum</i>	KM
	Lichens	MS
	General properties and structure of viruses	KM
December 2 nd week	Algal type study – Chlorella, Cosmarium	MS
	Isolation, purification, assay of viruses	KM
	Algal type study – Diatoms, Gracilaria	MS
	Viral taxonomy, Capsid symmetry	KM
January 1 st week	General characters, classification & economic importance of protozoa	MS
	Animal viruses – HIV, Corona	KM
	Type study of protozoa – Amoeba, Euglena, Paramoecium	MS
	Animal viruses – Ortho & Paramyxoviruses	KM
January 2 nd week	Type study of protozoa – Trichomonas, Trypanosoma	MS
	Animal viruses - Oncogenic viruses	KM
	Plant viruses – TMV, ring spot virus	MS
	Microbial viruses – T4, T7	KM
January 3 rd week	Viroids & Prions	MS
	Microbial viruses – Lambda	KM
	Microbial viruses – Cyanophages & Mycophages	MS
	Revision	KM
January 4 th week	Revision	MS
	Question Bank distribution	KM
	Discussion of University question papers	MS
	Class Test	KM

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5th SEMESTER

	Subject Title Agricultural Microbiology and Environmental Microbiology	
Semester: V	Paper: MBT 501	
	Portions Planned for 1 hour	Teacher
October 3 rd week	Soil-Definition, types and characters , Soil profile,	MS
	Soil microorganisms: Soil Bacteria, Soil Fungi, Actinomycetes, Viruses, Protozoa, Algae	MS
	Air micro flora of indoor: Factors affecting air micro flora ,Endo toxins.	KM
October 4 th week	Air micro flora of outdoor air. Factors affecting air micro flora, significance of air borne Microbes	KM
	Interactions Microorganisms of rhizosphere, rhizoplane and phylloplane	MS
	Techniques of trapping air borne microorganisms-impaction,	KM
November 1 st week	Mycorrhizae types and applications	MS
	Techniques of trapping air borne microorganisms impingers	KM
	Techniques of trapping air borne microorganisms - filtration	MS
November 2 nd week	Interaction between plants and microorganisms-Positive interactions	MS
	Biohazards in occupational Environment.	KM
	Interaction between plants and microorganisms- Negative interactions	KM
November 3 rd week	Aquatic microbiology- water pollution, biological indicators ,distribution of microbes in aquatic environment	MS
	Bio-geo chemical cycles - Carbon & Nitrogen cycles.	KM
	Allergy testing	MS
November 4 th week	Determination of the sanitary quality of water- MPN index, Coliform test, Membrane filtration	KM
	Biodegradation of Cellulose, Pectin	KM
	Determination of the sanitary quality of water-	MS

December 1 st week	Biodegradation of Pesticides & Plastics	MS
	Parameters of potable water	KM
	Copper and Iron Bioleaching- Ore forms available, area of deposits, Methods of leaching, significance	MS
December 2 nd week	Microorganisms in Agriculture- Genetics & Biochemistry of Nitrogen fixation	KM
	Symbiotic N ₂ fixation - Rhizobium	MS
	Non Symbiotic- Azotobacter and BGA	KM
January 1 st week	Microorganisms in Agriculture- Azospirillum associations	MS
	Biofertilizers- Definition & Types: Bacterial, fungal, phosphate solubilizers.	KM
	Biofertilizers- BGA, Plant-Azolla Biofertilizers- Kind of association & Mode of application and Merits.	MS
January 2 nd week	Biofertilizers- BGA, Plant-Azolla Biofertilizers- Kind of association & Mode of application and Merits.	MS
	Biopesticides- Introduction & Types- Bacterial(B.thuringensis), Viral(NPV) and Fungal (Trichoderma)	KM
	Biopesticides- Mode of action, factors influencing, genes involved & target pests.	MS
January 3 rd week	Study of microbes as Plant Pathogens- Fungal: Puccinia, Plasmopara & Cercospora	MS
	Study of microbes as Plant Pathogens- Bacterial: Xanthomonas oryzae	MS
	Study of microbes as Plant Pathogens- Mycoplasma- Sandal spike	KM
January 4 th week	Study of microbes as Plant Pathogens- Viruses: Tomato leaf curl	MS
	Discussion of old question papers	KM
	Open book test	KM

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5th SEMESTER

Name of the Department: MICROBIOLOGY	Subject Title Food and Dairy Microbiology	
Semester: V	Paper: MBT 503	
	Portions Planned for 1 hour	Teacher
October 3 rd week	Physical & Chemical properties of milk	KM
	Food as a Substrate for microorganism , Sources of Contamination.	MS
	Spoilage of Canned food	MS
October 4 th week	Microorganisms of Milk	MS
	Spoilage of fruits and vegetables, cereals and meat & fish	KM
	Food sanitation and control	KM
November 1 st week	Microorganisms of Milk- Sources of microbial contamination	MS
	Food spoilage and food poisoning - Endotoxins	MS
	Salmonellosis	KM
November 2 nd week	Staphylococcal poisoning	MS
	Rapid platform tests	KM
	Botulism	KM
November 3 rd week	SPC, Dye reductase test	MS
	Mycotoxins - Aflatoxins	MS
	Principles of food preservation	KM
November 4 th week	Methods of preservation of milk	KM
	Pasteurization	KM
	Methods of food preservation-high temperature	MS
December 1 st week	Sterilization and dehydration of milk	KM
	Methods of food preservation- freezing	MS
	Methods of food preservation- canning and dehydration	MS
December 2 nd week	Fermentation in milk- Souring, lactic and fermentation	KM
	Fermentation in milk- colour and flavor fermentation	KM
	Methods of food preservation-radiation and food additives	MS
January 1 st week	Fermentation in milk- Gassy fermentation and Proteolysis	KM
	Microbial examination of food-DMC, viable colony count	MS
	Microbial examination of food-examination of faecal streptococci	MS

January 2 nd week	Fermented Milk Products: Yogurt	KM
	Cheese production	KM
	Single cell proteins: Yeast	MS
January 3 rd week	Cheese production	KM
	Single cell proteins: : Spirulina, Single cell oil	MS
	Probiotics and prebiotics	MS
January 4 th week	Revision	MS
	Discussion of old question papers	KM
	Class test	MS