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ACADEMIC PLANNER & UNITIZATION OF SYLLABUS

ACADEMIC YEAR/SEMESTER	**2023-24**	**I Semester**
DEPARTMENT	**MICROBIOLOGY**	
SUBJECT/PAPER	**MBL 101 - General Microbiology**	

MONTH -1 (August)

WEEK	DAY	PORTIONS PLANNED FOR 1 HOUR	FACULTY
1	1	Orientation & Department activities (PPT)	KM
	2	Bridge course	MS
	3	Bridge course	KM
	4	***Bridge course***	MS
2	1	Bridge course	KM
	2	Bridge course (test)	MS
	3	History of Microbiology , Origin of life	KM
	4	Stains, Physical and chemical theories of staining	MS
3	1	Abiogenesis v/s biogenesis, end of the debate, other important landmarks	KM
	2	Stains and Staining Techniques-Nature of Dyes	MS
	3	Contribution of Scientists to the field of Microbiology - Antony Van Leewenhock,Louis Pasteur	KM
	4	Classification of staining	MS
4	1	Robert Koch	KM
	2	Staining Techniques-Simple Staining (positive, negative)	MS
	3	Alexander Fleming, Lazzaro Spallanzani	KM
	4	Differential Staining – Gram Staining, Acid fast staining	MS
TEST 1			

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MONTH -2 (October)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Edward Jenner, Joseph Lister	KM
	2	Structural staining –endospore, capsule, inclusion bodies	MS
	3	Principles of Microscopy	KM
	4	***Sterilization – principles & types***	MS
2	1	Photomicrography, Dark field microscopy	KM
	2	Physical methods of sterilization - heat	MS
	3	Phase contrast microscopy , Fluorescence microscopy	KM
	4	Physical methods of sterilization – radiation, filtration	MS
3	1	Electron Microscopy- TEM, SEM	KM
	2	Chemical methods of sterilization	MS
	3	Overview of prokaryotic cell structure Size, shape and arrangement of prokaryotic cells	KM
	4	Preservation of Microorganisms	MS
4	1	Cell wall and cell membrane	KM
	2	Structure and functions of organelles	MS
	3	Components external to cell wall	KM
	4	Structure and functions of organelles	MS
TEST 2			

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MONTH -3 (November)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Components internal to cell wall	KM
	2	Structure and functions of organelles	MS
	3	Bacterial endospore – structure & formation	KM
	4	***Structure and functions of organelles***	MS
2	1	Reproduction in bacteria	KM
	2	Reproduction in fungi	MS
	3	Reproduction in bacteria	KM
	4	Reproduction in fungi	MS
3	1	Discussion of old question papers	KM
	2	Revision 1	MS
	3	Revision 2	KM
	4	Question bank	MS
4	1	Open book writing of University questions and answers	KM
	2	Class test 1	MS
	3	Class test 2	KM
	4	Revision	MS

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ACADEMIC YEAR/SEMESTER	**2023-24**	**III Semester**
DEPARTMENT	**MICROBIOLOGY**	
SUBJECT/PAPER	**MBL 103 – Microbial Diversity**	

MONTH -1 (October)

WEEK	DAY	PORTIONS PLANNED FOR 1 HOUR	FACULTY
1	1	Syllabus Discussion	KM
	2	Basic concepts, Definition and levels of biodiversity	MS
	3	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Archaea	KM
	4	Biosystematics – classification	MS
2	1	Archaeal type study – Methanogens, *Thermus aquaticus*	KM
	2	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Bacteria	MS
	3	Numerical classification & Chemotaxonomy	KM
	4	Bergey's manual	MS
3	1	Bacterial type study – *E. coli, Bacillus, Staphylococcus*	KM
	2	Study & measures of Microbial diversity	MS
	3	Conservation & Economic Value of Microbial Diversity	KM
	4	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Cyanobacteria	MS
4	1	General characters, classification & economic importance of fungi.	KM
	2	Cyanobacteria type study – *Nosctoc, Microcystis, Spirulina*	MS
	3	Salient features and reproduction - *Rhizopus*	KM
	4	General characteristics, classification, Economic importance, Distribution & factors regulating distribution of actinomycetes	MS
TEST 1			

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MONTH -2 (November)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Salient features and reproduction - Saccharomyces	KM
	2	Actinomycetes type study –*Streptomyces, Nocardia, Frankia*	MS
	3	Salient features and reproduction – Aspergillus, Fusarium	KM
	4	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Rickettsiae – *Rickettsia rickettsi*	MS
2	1	Salient features and reproduction - *Agaricus*	KM
	2	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Chlamydiae – *Chlamydia trachomatis*	MS
	3	General characters, classification & economic importance of algae	KM
	4	General characteristics, classification, Economic importance, Distribution and factors regulating distribution of Spirochetes – *Treponema pallidum*	MS
3	1	Lichens	KM
	2	General properties and structure of viruses	MS
	3	Algal type study – *Chlorella, Cosmarium*	KM
	4	Isolation, purification, assay of viruses	MS
4	1	Algal type study – Diatoms, *Gracilaria*	KM
	2	Viral taxonomy, Capsid symmetry	MS
	3	General characters, classification & economic importance of protozoa	KM
	4	Animal viruses – HIV, Corona	MS
TEST 2			

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MONTH -3 (December)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Type study of protozoa – *Amoeba, Euglena, Paramoecium*	KM
	2	Animal viruses – Ortho & Paramyxoviruses	MS
	3	Type study of protozoa – *Trichomonas, Trypanosoma*	KM
	4	Animal viruses - Oncogenic viruses	MS
2	1	Plant viruses – TMV, ring spot virus	KM
	2	Microbial viruses – T4, T7	MS
	3	Viroids & Prions	KM
	4	Microbial viruses – Lambda	MS
3	1	Microbial viruses –Cyanopahges	KM
	2	Microbial viruses –Mycophages	MS
	3	Revision	KM
	4	Revision	MS
4	1	Question Bank distribution	KM
	2	Discussion of University question papers	MS
	3	Class Test I	KM
	4	Class Test II	MS

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ACADEMIC YEAR/SEMESTER	**2023-24**	**V Semester**
DEPARTMENT	**MICROBIOLOGY**	
SUBJECT/PAPER	**MBL 105-I MOLECULAR BIOLOGY**	

MONTH -1 (October)

WEEK	DAY	PORTIONS PLANNED FOR 1 HOUR	FACULTY
1	1	Central dogma of molecular biology,	MS
	2	Introduction to transcription	KM
	3	Structure and types of DNA	MS
	4	Transcription bubble, Stages of transcription	KM
2	1	Structure and types of DNA	MS
	2	Bacterial RNA polymerase - structure	KM
	3	Structure and types of RNA	MS
	4	Bacterial RNA polymerase - mechanism	KM
3	1	Structure and types of RNA	MS
	2	Recognition of promoters and DNA melting	KM
	3	Gene, Genetic code	MS
	4	Transcription Initiation	KM
4	1	DNA Replication: Bacterial Cell cycle	MS
	2	Transcription Elongation & Termination	KM
	3	Types of DNA replication- Rolling. Circle and theta model	MS
	4	Abortive transcription, Transcription inhibitors	KM
TEST 1			

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MONTH -2 (November)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Modes of DNA replication- Conservative, Semi-Conservative and dispersive.	MS
	2	Eukaryotic Transcription	KM
	3	Steps in Initiation of replication, Enzymes in DNA replication,	MS
	4	RNA polymerases in Eukaryotes- Types and Mechanism of RNA polymerase	KM
2	1	Replicon, OriC. Replication fork, replisome, Okazaki fragments, Termination of replication.	MS
	2	Promoters, Transcription factors, basal apparatus,	KM
	3	RNA splicing and Processing: mRNA capping, polyadenylation,	MS
	4	Enhancers & silencers	KM
3	1	Pre-mRNA splicing, snRNPs, spliceosome, typesof splicing	MS
	2	Transcription Initiation, elongation, termination in eukaryotes	KM
	3	RNA maturation, Catalytic RNAs - auto splicing, ribozymes, RNA editing	MS
	4	Transaltion - structure tRNA, rRNA and ribosome	KM
4	1	Regulation of gene expression in eukaryotes co-activators and repressors, enhancers and insulators	MS
	2	Charging of tRNA, differences between initiator tRNA and elongator tRNA.	KM
	3	DNase I, histone	MS
	4	Steps in translation- Initiation, elongation, and termination	KM
TEST 2			

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MONTH -3 (December)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Regulation through modification of gene structure- DNA methylation.	MS
	2	Role of initiation factors in bacterial translation	KM
	3	Regulation through transcriptional activators	MS
	4	Formation of initiation complex, polypeptide, peptide bond formation, peptidyl transferase activity, translocation, termination	KM
2	1	Co-activators and repressors,	MS
	2	Differences between prokaryotic and eukaryotic translation. Regulation of translation. Post translational modifications of proteins	KM
	3	Enhancers and insulators	MS
	4	Protein maturation and secretion. Protein translocation and inhibitors.	KM
3	1	Regulatory mechanisms in bacteria- Positive and negative regulation	MS
	2	Operon concept, polycistronic mRNA. lac operon, trp operon	KM
	3	Catabolic repression and attenuation	MS
	4	Regulation of lytic & lysogenic life cycle in bacteriophage (λ page). Control of lytic cycle by regulatory proteins	KM
4	1	Revsion	MS
	2	Distribution of question bank	KM
	3	Discussion of university papers	MS
	4	Class Test	KM

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ACADEMIC YEAR/SEMESTER	**2023-24**	**V Semester**
DEPARTMENT	**MICROBIOLOGY**	
SUBJECT/PAPER	**MBL 105-II FOOD MICROBIOLOGY**	

MONTH -1 (October)

WEEK	DAY	PORTIONS PLANNED FOR 1 HOUR	FACULTY
1	1	Introduction to Dairy Microbiology, History of white revolution	MS
	2	Introduction, Food as a substrate for microorganisms	KM
	3	Properties of milk	MS
	4	***Intrinsic and extrinsic parameters affecting the growth of microbes***	KM
2	1	Nutritional value of milk.	MS
	2	Types of microorganisms in food- Moulds, yeasts and bacteria.	KM
	3	Types of milk- dried, liquid, condensed.	MS
	4	**Food borne infections and intoxications** - *Staphylococcal food poisoning, Botulism*	KM
3	1	Normal and contaminant microflora in milk, pathogenic microbes inmilk.	MS
	2	*Salmonellosis, Brucellosis, Listeriosis*	KM
	3	Starter culture and its types	MS
	4	***General account of Mycotoxins and Phycotoxins.***	KM
4	1	Sources of contamination of milk	MS
	2	Fermented vegetable- sauerkraut, pickles	KM
	3	Microbiological analysis of milk- Rapid platform tests	MS
	4	Fermented Meat- sausage. Fermented Beverages- kombucha. Sourdough	KM
TEST 1			

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MONTH -2 (November)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Microbiological analysis of milk- Rapid platform tests	MS
	2	Principles of food spoilage, Sources of food contamination,	KM
	3	Microbiological analysis of milk- Rapid platform tests	MS
	4	***Types of food spoilage***	KM
2	1	Preservation of milk- Pasteurization.	MS
	2	Spoilage of Meat, Poultry, Fish and Sea foods	KM
	3	Preservation of milk- Dehydration, sterilization	MS
	4	Spoilage of cereals, fruits and vegetables	KM
3	1	Packingof milk and dairy products.	MS
	2	Spoilage of canned food	KM
	3	**Fermentation in milk**: Lactic acid, gassy fermentation, souring, ropiness	MS
	4	***Principles of food Preservation.***	KM
4	1	Cheese- Types and production (Cheddar),	MS
	2	Methods of preservation- Physical (temperature,)	KM
	3	Tofu, Yoghurt, Acidophilus milk	MS
	4	Methods of preservation- Physical (Drying, irradiation)	KM
TEST 2			

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MONTH -3 (December)			
WEEK	**DAY**	**PORTIONS PLANNED FOR 1 HOUR**	**FACULTY**
1	1	Prebiotics, Probiotics.	MS
	2	Methods of preservation - chemical (Class I)	KM
	3	**Quality testing of food**- Rapid microbiological methods. Examination of fecal contamination	MS
	4	***Methods of preservation – chemical (Class II)***	KM
2	1	**Food sanitation and control -** Good Hygiene practices, GLP, GMP	MS
	2	Bio preservation, Food additives	KM
	3	HACCP and Food control agencies and their regulation.	MS
	4	Canning	KM
3	1	Bacterial indicator organisms in food contamination	MS
	2	Food Packaging- Types of packaging materials, properties and benefits.	KM
	3	Food Safety –risk and hazards	MS
	4	Food SafetyLaws and Regulations- BIS, FSSAI, Codex Alimentarius.	KM
4	1	Revsion	MS
	2	Distribution of question bank	KM
	3	Discussion of university papers	MS
	4	Class Test	KM