BANKURA SAMMILANI COLLEGE
Department of Microbiology

Microbiology Hons. (CBCS)
Syllabi module for Courses with **Lessons**

2022-23

Course / Paper Name	Class	Course Type	Course Code	Credit
Introduction to Microbiology & Microbial Diversity	**Semester 1**	**Theory**	**Core T-1**	**4**

Broad Topic With No. of Class hour allotted	Lesson Number	No. of Class Allotted	Lesson Topic
History and development of microbiology (15)	Lesson 1	2	History and development of microbiology,
	Lesson 2	3	Theory of Spontaneous generation, Germ theory of disease
	Lesson 3	4	Contributions of Leeuwenhoek, Koch, Pasteur, Jenner and Fleming etc.
	Lesson4	4	Anoverviewofthe Scope of microbiology
DiversityofMicrobialWorld (5)	Lesson5	1	Systems of Classification
	Lesson6	1	Basic idea about Hackle and Whittaker's kingdom concept
	Lesson7	2	Basic idea about domain concept of Carl Woose
		2	General characteristics and representative members of different groups:Cellular microorganisms (Archaea, Bacteria, Algae, Fungi and Protozoa)
	Lesson 8	2	General characteristics and representative members of different groups:Acellular microorganisms (Viruses, Viroids, Prions)
Basic Microscope (5)	Lesson 9	2	Basic Principle of Compound Microscope, & Types
	Lesson 10	2	Bright Field &Dark Field Microscope
		1	Phase Contrast Microscope
Remedial/Tutorial		2	Spill Over
Phycology (15)	Lesson 11	1	General characteristicsofalgae
	Lesson 12	2	Vegetative, asexual and sexual reproduction
	Lesson 13	2	Group- Chlorophyta,
	Lesson 14	2	Group-, Xanthophyta
	Lesson 15	2	Group- Cyanophyta
	Lesson 16	3	Applicationsofalgaeinagriculture,industry,environmentandfood
Mycology (15)	Lesson 17	3	General characteristics of fungi
	Lesson 18	3	Asexual & sexual reproduction
	Lesson 19	2	Heterokaryosis,heterothallismandparasexualmechanism

	Lesson 20	2	Phycomycetes&Ascomycetes,
	Lesson 21	2	Basidiomycetes &Deuteromycetes.
	Lesson 22	2	Economic importance of Fungi
Protozoa (5)	Lesson 23	1	General characteristics of Protozoa
	Lesson 24	*3*	*Amoeba, Paramecium, Plasmodium*
	Lesson 25	1	Economic importance of protozoa
Remedial/Tutorial		2	Spill Over

Course / Paper Name	Class	Course Type	Course Code	Credit
Introduction to Microbiology & Microbial Diversity	**Semester 1**	**Practical**	**Core P-1**	**2**

Exp. Number	Class Plan	No. of Classes allotted	ExperimentName
Exp. 1	Week 1	4	Microbiology Laboratory Management and Biosafety
Exp. 2	Week 2	6	To study the principle and applications of important instruments (autoclave, incubator, hot air oven, centrifuge, light microscope, pH meter) used in the microbiology laboratory
Exp. 3	Week 3	2	Preparation of culture media (Nutrient Broth an Nutrient Agar) for bacterial cultivation
Exp. 4	Week 4	1	Sterilization of medium using Autoclave and assessment for sterility
Exp. 5	Week 5	1	Sterilization of glassware using Hot Air Oven
Exp. 6	Week 6	1	Sterilization of heat sensitive material by filtration
Exp. 7	Week 7	2	Motility test by hanging drop method.
Exp. 8	Week 8	3	Study of *Rhizopus, Penicillium, Aspergillus* using permanent mounts
Exp. 9	Week 9	3	Study of *Spirogyra,Chlamydomonas*using permanent Mounts
Exp.10	Week 10	3	Study of *Paramecium, Plasmodium*using permanent mounts

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Course / Paper Name	Class	Course Type	Course Code	Credit
Bacteriology	**Semester 1**	**Theory**	**Core T-2**	**4**

Broad Topic	Lesson Number	No. of Class allotted	Lesson Topic
Cell organization	Lesson 1	2	Cell size, shape and arrangement, glycocalyx, capsule, flagella, endoflagella, fimbriae and pili.
	Lesson 2	3	Cellwall: Composition and detailed structure of Gram-positive and Gram-negative cell walls, Archaebacterial cell wall
	Lesson 3	4	Gram and acid fast staining mechanisms, lipopolysaccharide (LPS), sphaeroplasts, protoplasts, and L-forms. Effect of antibiotics and enzymes on the cell wall.
	Lesson 4	2	Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes.
	Lesson 5	3	Cytoplasm: Ribosomes, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids Endospore: Structure, formation, stages of sporulation.
Bacteriological techniques	Lesson 6	2	Pure culture isolation: Streaking, serial dilution and plating methods
	Lesson 7	1	Cultivation, maintenance and preservation/stocking of pure cultures
	Lesson 8	2	Cultivation of anaerobic bacteria, and accessing non-culturable bacteria.
Remedial/Tutorial			
Growth and Nutrition	Lesson 9	1	Nutritional requirements in bacteria and nutritional categories
	Lesson 10	3	Culture media: components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media
	Lesson 11	1	Physical methods of microbial control: heat, low temperature, high pressure, filtration, desiccation, osmotic pressure, radiation
	Lesson 12	1	Chemical methods of microbial control: disinfectants, types and mode of action.
Reproduction in Bacteria	Lesson 13	2	Asexual methods of reproduction
	Lesson 14	2	Logarithmic representation of bacterial populations
	Lesson 15	4	Phases of growth, calculation of generation time and specific growth rate.
Important archaeal and eubacterial groups	Lesson 16	5	Archaebacteria: General characteristics, suitable example and economic importance.
	Lesson 17	4	Eubacteria: General characteristics with suitable example.
	Lesson 18	6	Gram Negative: Non proteobacteria, Alpha proteobacteria, Beta proteobacteria, Delta proteobacteria, Epsilon proteobacteria, Zeta proteobacteria.
	Lesson 19	4	Gram Positive: Low G+ C (Firmicutes), High G+C (Actinobacteria). Cyanobacteria: An Introduction
Culture preservation techniques	Lesson20	4	Short-term preservation methods: Slant, Stab, Oil immersion,
	Lesson 21	2	Long-term preservation methods: Lyophilization,
	Lesson 22	2	Long-term preservation methods: Cryopreservation
Remedial/Tutorial			

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Bacteriology	**Semester 1**	**Practical**	**Core P-2**	**2**

Exp. Number	Class Plan	No. of Classes allotted	Experiment
Exp. 1	Week 1	5	Preparation of different media: Complex media-Nutrient agar, MacConkey agar, EMB agar.
Exp. 2	Week 2	1	Simple staining
Exp. 3	Week 3	1	Negative staining
Exp. 4	Week 4	2	Gram's staining
Exp. 5	Week 5	1	Acid fast staining-permanent slide only.
Exp. 6	Week 6	2	Endospore staining.
Exp. 7	Week 7	6	Isolation of pure cultures of bacteria from soil/ water by streak plate, pour plate and spread plate method.
Exp. 8	Week 8	3	Preservation of bacterial cultures (slant / stab).
Exp. 9	Week 9	2	Isolation and enumeration of bacteria from air