

DEPARTMENT OF MOLECULAR BIOLOGY & BIOTECHNOLOGY
LESSION PLAN
SESSION 2023-24
SEMESTER – IV

NAME OF TEACHER: MS. UPASANA DAS

**PAPER ALLOTTED: MLBGCOR04T OR MLBHGECO4T : PHYSICOCHEMICAL
 TECHNIQUES AND MICROBIAL GENETICS (THEORY) & MLBGCOR04P OR
 MLBHGECO4P : PHYSICOCHEMICAL TECHNIQUES AND MICROBIAL GENETICS
 (PRACTICAL)**

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	MLBGCOR04T OR MLBHGECO4T	Unit 4: Centrifugation: Theory of ultracentrifugation, Relative centrifugal force (RCF), Sedimentation rate sedimentation coefficient, Isopycnic (equilibrium) sedimentation (discussion with example e.g. Meselson and Stahl Experiment). Unit 6: Chromatography: Partition co-efficient, paper chromatography and its applications (including 2-D), Thin layer chromatography.	8
	MLBGCOR04P OR MLBHGECO4P	Measurement of viscosity/fluidity of biological sample by Ostwald viscometer. Separation of sugars by paper chromatography.	16
April 2024	MLBGCOR04T OR MLBHGECO4T	Column packing and fraction collection, Gel filtration chromatography, Ion- exchange chromatography and affinity chromatography, GLC, HPLC.	7
	MLBGCOR04P OR MLBHGECO4P	Determination of bacterial growth using turbidometry	16
May 2024	MLBGCOR04T OR MLBHGECO4T	Unit 7: Electrophoresis: Principle and applications of native polyacrylamide gel electrophoresis, SDS- polyacrylamide gel electrophoresis, 2D gel electrophoresis, Agarose gel electrophoresis.	4
	MLBGCOR04P OR MLBHGECO4P	Separation of proteins by SDS- PAGE	12

June 2024		Internal Examination & Class for Slow Learners	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			67

NAME OF TEACHER: DR. INDRANI DATTA

PAPER ALLOTTED: MLBGCOR04T OR MLBHGECO4T : PHYSICOCHEMICAL
TECHNIQUES AND MICROBIAL GENETICS (THEORY)& MLBSSECO2M :
BIOTECHNOLOGY IN SUSTAINABLE DEVELOPMENT

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	MLBGCOR04T OR MLBHGEC04T	Unit 5: Spectrophotometry: Electromagnetic spectrum, Introduction to concepts of absorption and emission spectroscopy, Absorption of light, Transmittance, Absorbance (Optical density), Lambert-Beer's law and its limitations, Concept of Molar extinction co-efficient, Study of absorption spectra of Proteins and Nucleic Acids, Analysis of Proteins and Nucleic Acids using UV and Visible spectroscopy, Colorimetry. Unit 8: Microbial Genetics: Structure of prokaryotic gene, Genome organisation in prokaryotes, Extrachromosomal inheritance, Plasmids (copy No and compatibility), Episomes.	8
	MLBSSEC02M	Unit 1: Biofertilization, Phytosimulation, Bioinsecticides: Plant growth promoting bacteria, biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non-Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers.	8
April 2024	MLBGCOR04T OR MLBHGEC04T	Genetic recombination in bacteria: Mechanism of bacterial transformation, Conjugation (Discovery),	4
	MLBSSEC02M	Unit 2: Secondary Agriculture Biotechnology: Biotech feed, Silage, Biomanure, biogas, biofuels – advantages and processing parameters.	8
May 2024	MLBGCOR04T OR MLBHGEC04T	Conjugation (F factor, <i>Hfr</i> and <i>F'</i> strains) and Mechanism of bacterial transduction (Generalized transduction and specialized transduction).	5

	MLBSSEC02M	GM crops: Advantages, social and environmental aspects, Bt crops, golden rice, transgenic animals.	6
June 2024		Internal Examination & Class for Slow Learners	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			43

NAME OF TEACHER: MS. PARAMITA GHOSH

PAPER ALLOTTED: MLBGCOR04T OR MLBHGE04T : PHYSICOCHEMICAL TECHNIQUES AND MICROBIAL GENETICS (THEORY) & MLBGCOR04P OR MLBHGE04P : PHYSICOCHEMICAL TECHNIQUES AND MICROBIAL GENETICS (PRACTICAL)

Month	Paper	Topic	No. of classes
March 2024 (02.03.2024)	MLBGCOR04T OR MLBHGE04T	Unit1: Diffusion: Diffusion in fluids, Fick's laws (Statement and explanation) Facilitated diffusion e.g. gas exchanges in lungs.	4
April 2024	MLBGCOR04T OR MLBHGE04T	Unit 2: Osmosis: Definition, contrast with diffusion, Tonicity and isotonic solutions. Effect of tonicity on R.B.C. Cell nutrition. Unit 3: Viscosity: Definition, Laminar and turbulent flow, Concept of Reynolds number, Newton's law of viscosity, Newtonian and non-Newtonian fluids, Coefficient of viscosity, Relative viscosity and fluidity. Measurement by Ostwald's viscometer.	8
May 2024	MLBGCOR04T OR MLBHGE04T	Dependence of viscosity on temperature and other factors e.g. size and shape of solutes (general idea), Viscosity of human blood (general idea).	4
June 2024		Internal Examination & Class for Slow Learners	4
July 2024		END SEMESTER EXAMINATION	
Total Classes			20

