MAHARAJA MANINDRA CHANDRA COLLEGE
DEPARTMENT OF ZOOLOGY
NAME OF THE PROGRAM: ZOOLOGY MULTIDISCIPLINARY COURSE (MDC)
LESSON PLAN OF SEMESTER I

Name of the Faculty	Paper Code/ Allotted Topic/Text	Sub-Topic/Lesson Plan	Time Period (Month/ Year)	Number of Lectures
Dr. Asima Das Chattopadhyay	**CC1 MZOO-MDC Cell Biology**	**Unit 1: Plasma Membrane** Structure of the Plasma Membrane: Lipid Bilayer (Phospholipids and Cholesterol), Peripheral and Integral Membrane proteins, Glycolipids and Glycoproteins (basic concept of Glycocalyx), Fluid Mosaic Model with special reference to Lipid rafts, Mobility of membrane lipids (FRAP assay) and Mobility of Membrane Proteins (Frye-Edidin Experiment); Cell-cell junctions; Transport through plasma membrane.	1st week of September – Last week of September	8
		Unit 2: Cytoplasmic Organelles I Basic concepts on Ultrastructure of ER, Golgi and Lysosome; Overview of Protein sorting; ER Morphology, Targeting proteins to ER, The Signal hypothesis; Insertion of proteins into ER membrane, Protein folding and processing in ER, Export of proteins and lipids from ER; Golgi Apparatus; Morphology, Protein glycosylation within Golgi, Protein sorting and export from Golgi apparatus; Lysosome: Polymorphism, Lysosomal acid hydrolases, Endocytosis and lysosome formation.	1st week of November – Last week of November	8
		Unit 3: Cytoplasmic Organelles II Mitochondria: Structure; Mitochondrial Respiratory Chain, Chemiosmotic hypothesis and Oxidative Phosphorylation with reference to ATP Synthase and ATP synthesis; Centrosome and its organization.	1st week of December – 3rd week of December	4
		Unit 4: Cytoskeleton Structure and Types: Microtubules, Actin filaments, and Intermediate filaments; Composition and function of ECM.	1st week of January – 3rd week of January	4
Dr. Saikat Roy	**CC1 MZOO-MDC Cell Biology**	**Unit 5: Nucleus** Nuclear envelope, nuclear pore complex (transport not included), Kinetochore and centromeric DNA; Chromatin and levels of its packaging. Euchromatin & Heterochromatin.	1st week of September – Last week of September	5

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		Unit 6: Nucleic Acids Structure and composition of DNA: Chargaff's Rule; Hypo and Hyperchromic shift; Watson and Crick Model of the Three-Dimensional Structure of DNA. Different forms of DNA-A, B and Z DNA (comparative overview) RNA as the Genetic Material, Types and Function.	1st week of November – Last week of November	3
		Unit 7: DNA Replication Meselson–Stahl Experiment, DNA Replication in Prokaryotes [Bidirectional and discontinuous]; Enzymes/Proteins associated with Replication -Polymerase [I, II & III], Primase, Helicase, SSB, DNA ligase; RNA priming; End replication Problem and Replication of telomeres in eukaryotes.	1st week of December – 3rd week of December	10
		Unit 8: Tools and Techniques in Cell Biology Animal Cell Culture: Primary cell culture and Cell line. Subcellular fractionation and Ultracentrifugation. Freeze fracture Replication and Freeze Etching. Working Principle of Light Microscope: Bright field, Phase contrast microscope, Fluorescence Microscope with reference to FRET; Working Principle of SEM & TEM.	1st week of January – 3rd week of January	4