

LESSON PLAN

Session 2024-25

Class: Major B.Sc. I IMB 1st Sem

Subject: Introduction of Microbiology

Paper code: B23-IMB-101

Name of the faculty: Ms. Preeti Handa

Month	Week	Topics to be covered
July	22.07.24 -27.07.24	History, Microbiology in India; Application of microbiology: Food and industry.
	29.07.24- 30.07.24	Microbes in genetic engineering and biotechnology; Microbes in environmental microbiology (microbes in biogeochemical cycles); Microbes in pollution microbiology; Microbes in medical microbiology
August	01.08.24 -03.08.24	Microbial diversity; five kingdom classification; three domain classification; taxonomy,
	05.08.24 -10.08.24	General methods of classifying bacteria; Genetic relatedness (DNA-DNA hybridization, 16S rRNA sequencing, classification and identification of bacteria)
	12.08.24 -17.08.24	Bacterial nomenclature; Bergey's system of bacterial classification
	19.08.24 - 24.08.24	Test
	26.08.24 -31.08.24	Quiz on one-word short questions.
September	02.09.24 -07.09.24	Isolation and culture of microorganisms- Mixed Cultures; Serial dilution method, Viable plate count by Streaking, spread plate method and Pour plate method
	09.09.24 -14.09.24	Test
	16.09.24 -21.09.24	Isolation of anaerobic microbes, Culture Characteristics – Colony appearance, Colony forms, Colony elevation, Colony margins, Optical density, Colony colour, Colony

		Odour, Colony consistency.
	23.09.24 - 29.09.24	Microbial growth: Growth curve of bacteria – Measurement of growth, batch culture. Synchronous growth, Diauxic growth Culture
	30.09.24	Test
October	01.10.24 - 05.10.24	Characteristics of a medium, Types of media (liquid, semisolid, solid, selective, enrichment, differential) Preparation of Media, requirements of medium,
	07.10.24 - 12.10.24	Sessional Test
	14.10.24 - 19.10.24	Nutritional types of microbe Preservation method: Lyophilisation, Liquid nitrogen, Serial subculture, Refrigeration, stocks of soil; Physical control: Autoclave, Hot air oven, Boiling, Tyndallisation; Chemical control: Alcohol, Halogens, ethylene oxide, Formaldehyde.
	21.10.24 - 26.10.24	Morphology of bacteria – Size and Shape; Arrangements. Structure of Bacterial cells – Capsule, Flagella, Locomotion, Fimbriae or pili; Chemotaxis;
Vacations	27.10.24 - 03.11.24	Diwali Vacations
November	04.11.24 - 09.11.24	The cell wall Plasma membrane; Mesosomes; Cytoplasm: Ribosomes; Nucleoid, Plasmids; Cytoplasmic inclusions, (granules, lipid granules, glycogen, sulfur granules, magnetosomes, gas vesicles, gas vacuoles), Spores and cysts,
	11.11.24 - 16.11.24	Cell Structure of cyanobacteria, Algae, Fungi, Viruses: Cultivation, Cell cycle, Lysogenic and lytic phages, Protozoa
	18.11.24 - 22.11.24	Revision

LESSON PLAN

Session 2024-25

Class: Minor B.Sc. I IMB 1st Sem

Subject: General Microbiology

Paper code: B23-IMB-103

Name of the faculty: Ms Preeti Handa

Month	Week	Topics to be covered
July	22.07.24 -27.07.24	History, Microbiology in India; Application of microbiology: Food and industry.
	29.07.24- 30.07.24	Microbes in genetic engineering and biotechnology
August	01.08.24 -03.08.24	Microbes in pollution microbiology; Microbes in medical microbiology
	05.08.24 -10.08.24	Short question answer test
	12.08.24 -17.08.24	Microbes in environmental microbiology (microbes in biogeochemical cycles);
	19.08.24 - 24.08.24	Test
	26.08.24 -31.08.24	Quiz on one-word short questions.
September	02.09.24 -07.09.24	Isolation and culture of microorganisms- Mixed Cultures; Serial dilution method, Viable plate count by Streaking, spread plate method and Pour plate method
	09.09.24 -14.09.24	Test
	16.09.24 -21.09.24	, Isolation of anaerobic microbes.
	23.09.24 - 29.09.24	Microbial growth: Growth curve of bacteria – Measurement of growth, batch culture. Synchronous growth, Diauxic growth Culture
	30.09.24	Test
October	01.10.24 - 05.10.24	Characteristics of a medium, Types of media (liquid, semisolid, solid, selective, enrichment, differentia) Preparation of Media, requirements of medium,
	07.10.24 -12.10.24	Sessional Test
	14.10.24 - 19.10.24	Nutritional types of microbe Preservation method: Lyophilisation, Liquid nitrogen, Serial

		subculture, Refrigeration, stocks of soil; Physical control: Autoclave, Hot air oven, Boiling, Tyndallisation; Chemical control: Alcohol, Halogens, ethylene oxide, Formaldehyde.
	21.10.24 - 26.10.24	Morphology of bacteria – Size and Shape; Arrangements. Structure of Bacterial cells – Capsule, Flagella, Locomotion, Fimbriae or pili; Chemotaxis;
Vacations	27.10.24 -03.11.24	Diwali Vacations
November	04.11.24 -09.11.24	The cell wall Plasma membrane; Mesosomes; Cytoplasm: Ribosomes; Nucleoid, Plasmids; Cytoplasmic inclusions, (granules, lipid granules, glycogen, sulfur granules, magnetosomes, gas vesicles, gas vacuoles), Spores and cysts
	11.11.24 - 16.11.24	Cell Structure of cyanobacteria, Algae, Fungi, Viruses, Protozoa
	18.11.24 -22.11.24	Revision

LESSON PLAN

Session 2024-25

Class: B.Sc. II Biotech 3rd Sem

Subject: Cell biology

Paper code: B23-BTY-301

Name of the faculty: Ms. Preeti Handa and Ms. Reetu Kamboj

Month	Week	Topics to be covered
July	22.07.24 -27.07.24	Discovery of cell and Cell Theory; Comparison between plant and animal cells; Structure and function of Protoplasm
	29.07.24- 30.07.24	Cell wall, Plasma membrane, Modification of plasma membrane and intracellular junctions,
August	01.08.24 -03.08.24	Cytoskeleton, Mitochondria, Chloroplast, ER, Golgi complex.
	05.08.24 -10.08.24	Short question answer test
	12.08.24 -17.08.24	Structure and function of Lysosome, endosome and microbodies, Ribosome, Centriole, Nucleus
	19.08.24 - 24.08.24	Test
	26.08.24 -31.08.24	Quiz on one-word short questions.
September	02.09.24 -07.09.24	Chromosomes, Chemical components of a cell, Catalysis and use of energy by cells. Biogenesis of Cellular organelles – Biogenesis of mitochondria, chloroplast,
	09.09.24 -14.09.24	Test
	16.09.24 -21.09.24	ER, Golgi complex, Biosynthetic process in ER and Golgi apparatus, Protein synthesis and folding in the cytoplasm, Degradation of cellular components.
	23.09.24 - 29.09.24	Structure and function of Prokaryotic cell and its components - The Slime and the cell wall of bacteria containing peptidoglycan and related molecules; the outer membrane of Gram-negative bacteria, the cytoplasmic membrane.

	30.09.24	Test
October	01.10.24 - 05.10.24	Water and ion transport, mesosomes, flagella, Pilus, fimbriae, ribosomes, carboxysomes, sulfur granules, glycogen, polyphosphate bodies, fat bodies, gas vesicles; endospores, exospores, cysts.
	07.10.24 -12.10.24	Sessional Test
	14.10.24 - 19.10.24	Mycelia of fungi and Actinomycetes, Cytoskeleton filament, heterocysts and akinets of Cyanobacteria, Gliding and motility
	21.10.24 - 26.10.24	Models of membrane structure, Membrane lipids, proteins and carbohydrates
Vacations	27.10.24 -03.11.24	Diwali Vacations
November	04.11.24 -09.11.24	Solute transport by Simple diffusion, Facilitated diffusion and Active transport Cell cycle - An overview of cell cycle,
	11.11.24 - 16.11.24	Components of cell cycle control system, Intracellular and Extra-cellular control of cell division, Programmed cell death (Apoptosis)
	18.11.24 -22.11.24	Revision

LESSON PLAN

Session 2024-25

Class: Major B.Sc. III Biotech 5th Sem

Subject: Animal biotechnology

Paper code: XI

Name of the faculty: Ms. Preeti Handa

Month	Week	Topics to be covered
July	22.07.24 -27.07.24	Introduction, Principles & practice. History and Development of animal cell culture. Scope and Applications. Culture Media: Media components, Serum containing and serum free media. Natural media Plasma clot, biological fluids, tissue extracts.
	29.07.24- 30.07.24	Growth factors required for proliferation of animal cells. Chemically defined media, balanced salt solutions. Physical requirements for growing animal cells in culture. Washing, drying, sterilization practices, various instruments and their uses in animal cell culture practices.
August	01.08.24 -03.08.24	Primary Cell Culture techniques: Initiation of cell culture-substrates (glass, plastic, metals) their preparation and sterilization. Isolation of tissue explants, disaggregation-enzyme disaggregation and mechanical disaggregation of the tissue.
	05.08.24 -10.08.24	Development of primary culture and cell lines. Subculture. Contamination. Suspension culture, Growth curve of animal cells in culture. Secondary cell culture – transformed cell and continuous cell lines. Finite and infinite cell lines.
	12.08.24 -17.08.24	Cell lines: Insect and animal cells. Commonly used cell lines- their organization and characteristics. Cell repositories and their function. Karyotyping, biochemical and genetic characterization of cell lines.
	19.08.24 - 24.08.24	Test
	26.08.24 -31.08.24	Quiz on one-word short questions.
	02.09.24 -07.09.24	Organ Culture: technique, advantages, applications and

September		limitations. Artificial skin.
	09.09.24 -14.09.24	Test
	16.09.24 -21.09.24	Transfection of animal cells: transfection methods. Methods for cell fusion, Selectable markers, HAT selection and Antibiotic resistance. Cloning and expression of foreign genes in animal cells: Expression vectors. Over production and preparation of the final product i.e. expressed proteins.
	23.09.24 - 29.09.24	Production of vaccines in animal cells.
	30.09.24	Test
October	01.10.24 - 05.10.24	Hybridoma Technology: Production of monoclonal antibodies and their applications.
	07.10.24 -12.10.24	Sessional Test
	14.10.24 - 19.10.24	Embryo transfer technology- technique, its applications. Artificial insemination. Animal clones.
	21.10.24 - 26.10.24	Transgenic Animals: transgenic sheep, cow, pig, goat etc.
Vacations	27.10.24 -03.11.24	Diwali Vacations
November	04.11.24 -09.11.24	Production of transgenic mice, ES cells can be used for gene targeting in mice, applications of gene targeting
	11.11.24 - 16.11.24	Therapeutic products through genetic engineering – blood proteins, insulin, growth hormone etc. Gene Therapy: introduction, types of gene therapy, vectors in gene therapy, major achievements, problems and prospects
	18.11.24 -22.11.24	Revision

LESSON PLAN

Session 2024-25

Class: VAC BBA, BSc. FD,

BSc. Home Science 1st Sem

Subject: Environment Studies

Paper code: B23-VAC-

Name of the faculty: Ms. Preeti Handa

Month	Week	Topics to be covered
July	22.07.24 -27.07.24	Mul Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.
	29.07.24- 30.07.24	Definition, structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs
August	01.08.24 -03.08.24	Major ecosystems types: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystem (lakes, rivers, oceans).
	05.08.24 -10.08.24	Short question answer test
	12.08.24 -17.08.24	Natural resources: Renewable and Non- renewable Resources Land resources: Land degradation and soil erosion. Forest resources: Importance of forests, deforestation: causes.
	19.08.24 - 24.08.24	Test
	26.08.24 -31.08.24	Quiz on one-word short questions.
September	02.09.24 -07.09.24	Water resources: Use and over- exploitation of surface and ground water. Energy resources: Renewable and non-renewable energy sources.
	09.09.24 -14.09.24	Test
	16.09.24 -21.09.24	Definition and its types, Endangered and endemic species of India. Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions;
	23.09.24 - 29.09.24	Conservation of biodiversity: In-situ and Ex- situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic

		and informational values.
	30.09.24	Test
October	01.10.24 - 05.10.24	Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution. Solid waste management: Sources, methods of disposal: Landfill, incineration and composting.
	07.10.24 -12.10.24	Sessional Test
	14.10.24 - 19.10.24	Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environmental Policies & Practices Environmental laws: Environment (Protection) Act, 1986, Air (Prevention & Control of Pollution) Act, 1981, Water (Prevention and control of Pollution) Act, 1974.
	21.10.24 - 26.10.24	Disaster management: floods, earthquake, cyclones, landslides and drought.
Vacations	27.10.24 -03.11.24	Diwali Vacations
November	04.11.24 -09.11.24	Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected person.
	11.11.24 - 16.11.24	Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
	18.11.24 -22.11.24	Revision