

Academic Year: 2024-25

Semester: I (B.Sc.I)

Department: Microbiology

Subject: Microbiology

Course Title: DSC 03MIC12 : Bacteriology

Name of the teacher – Ms.V.V.Misal

Month : June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit I	A. General Principles of Microscopy : 1. Types of microscopes: a) light microscopes b) electron microscopes
5	8	13		
Month : July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit I	2.Light microscopy: a)Parts b)Image formation c)Magnification d)Numerical aperture e)Resolving power f) Working distance
5	8	13		
Month : August			Module/Unit:	Sub-units planned
5	8	13	Paper II Unit I	2. Ray diagram, special features and applications of : a) Compound Microscope b) Phase Contrast Microscope c) Electron Microscope d) Fluorescence Microscope Practical course I
Month : September			Module/Unit:	Sub-units planned
5	8	13	Paper II Unit I	B. Stains and Staining procedures 1. Definition of dye and stain 2. Classification of stains – Acidic, Basic and Neutral 3. Principles, Procedure, Mechanism of staining. procedures a) Monochrome staining b) Negative staining c) Differential staining : i) Gram's staining ii) Acid fast staining Practical course I



Month : October				
5	8	13	Paper II Unit I	Special staining methods a) Cell wall (Chance's method) b) Capsule (Manvel's method) c) Volutin granule (Albert's method) Practical course I

V. Misal

Ms. Vrushi V. Misal



G. K. Sontakke

Dr. G. K. Sontakke

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Department of Microbiology
Annual Teaching Plan

Academic Year: 2024-25 Semester: II (B.Sc.I) Department: Microbiology

Subject: Microbiology Course Title: DSC03MIC22 Microbial Nutrition

Name of the teacher – Ms.V.V.Misal

Month : November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	Microbial Nutrition & Technique A. Microbial Nutrition : i) Nutritional requirement of microorganism ii) Concept of auxotroph Prototroph and fastidious organisms based on growth factor.
5	8	13		
Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	A. Microbial Nutrition: iii) Nutritional types of microorganism based on carbon and energy source.
5	8	13		
Month : January			Module/Unit:	
5	8	13	Unit I	B. Culture Media : i) Components of Media
Month : February				
5	8	13	Unit I	ii)Types of Media based on – Physical state Chemical nature Function
Month : March				
5	8			C. Cultivation of Microorganisms i) Use of culture media for cultivation
Month : April				
				ii) Conditions required for growth of Microorganisms

Ms.Vrushali V.Misal



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Department of Microbiology**

Annual Teaching Plan

Academic Year: 2024-25 **Semester:** III (B.Sc.II) **Department:** Microbiology

Subject: Microbiology **Course Title:** DSC03MIC32: Microbial Physiology

Name of the teacher – Ms.V.V.Misal

Month : July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper VI Unit I	A] Growth: Growth phases , measurement of growth ,continuous growth, synchronous growth and diauxic growth
6	8	14		
Month : August			Module/Unit:	
Lectures	Practicals	Total	Unit I	B] Effect of environmental factors on microbial growth : Temperature:- Mesophiles, psychrophiles, thermophiles , hyperthermophiles Thermal destruction of bacteria- D, F and Z and Z
6	8	14		
Month : September			Module/Unit:	
Lectures	Practicals	Total	Paper III Sec II, Unit IV	pH- Neutrophiles, Acidophiles and Alkalophiles Osmotic pressure – Isotonic, environments, hypotonic and hypertonic xerophiles and halophiles
6	8	14		
Month : October			Module/Unit:	
Lectures	Practicals	Total	Paper III Sec II, Unit IV	C]Transport across cell membrane– Diffusion, active transport and group translocation.
6	8	14		



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Department of Microbiology
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Academic Year: 2024-25

Semester: IV (B.Sc.II)

Department: Microbiology

Subject: Microbiology

Course Title: DSC03MIC42 MICROBIAL GENETICS

Name of the teacher – Ms.V.V.Misal

Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper VII Unit I	Basic terminologies–Gene,genome, genotype,phenotype,mutagen, recon, muton, cistron,split genes. Practical IV
5	8	13		
Month : January				
Lectures	Practicals	Total	Paper VII Unit I	2. Forms of DNA. 3. Genetic code – 4.Organization of chromosomal DNA in <i>E.Coli</i> Practical IV
5	8	13		
Month : February				
5	8	13	Paper VII Unit I	B. Mutation i) Basic concept of mutation ii) Spontaneous mutation Practical IV
Month : March				
5	8	13	Paper VII Unit I	Mutagens that distort DNA a) acridine dyes Practical IV
Month : April				
5	8	13	Paper VII Unit I	b) UV Light

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Annual Teaching Plan

Academic Year: 2024-25 Semester : V (B.Sc.III)

Department: Microbiology

Subject: Microbiology

Course Title: DSE:1010E1 IMMUNOLOGY

Name of the teacher – Ms.V.V.Misal .

Month : June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper : IX Unit I	1.Cells of Immune system – a.Hematopoiesis-characteristics & types of stem cells. b.Classification of cells of immune system . c. Structure & function of lymphoid cells d. Structure & function of myeloid cells
12	8	20		
Month : July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	2. Membrane receptors for antigen and their role in antigen recognition 3. Molecular mechanism of antibody production. Practical Course II
12	8	20		
Month : August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	2. Cytokines 3. Immunological tolerance : 4 . Interferon 1. Complement Practical Course II
12	8	20		
Month : September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit III	2.Monoclonal antibodies 1.New diagnostic techniques 2.Hypersensitivity Practical Course II
12	8	20		
Month : October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit IV	3.Autoimmunedisease

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Academic Year: 2024-25 Semester: VI (B.Sc.III) Department: Microbiology

Subject: Microbiology Course Title: DSE:1010F1 MICROBIAL GENETICS

Name of the teacher – Ms.V.V.Misal

Month : November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper : XIV Unit I	1. One cistron - one polypeptide hypothesis. Practical Course II
12	4	16		
Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	2. Molecular mechanism of gene expression Practical Course II
12	4	16		
Month : January			Module/Unit:	Sub-units planned
12	4	16	Unit II	1. Mutations 2. Methods of isolation and detection of mutants based on – a. Relative survival b. Relative growth c. Visual detection
Month : February			Module/Unit:	Sub-units planned
12	4	16	Unit III	1. Genetic complementation 2. Extrachromosomal inheritance:
Month : March			Module/Unit:	Sub-units planned
12	4	16	Unit IV	Techniques in Molecular Biology – a. DNA sequencing (Sanger's method) b. DNA Finger printing c. PCR
Month : April			Module/Unit:	Sub-units planned
12	4	16	Unit IV	Genetic engineering

Ms. Vrushali V. Misal



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Annual Teaching Plan

Academic Year: 2024-2025

Semester: B.Sc I Sem I

Department: Microbiology

Subject: Microbiology

Course Title: Introduction to microbiology and microbial diversity

Name of the teacher: Mr. Suraj D. Gabale

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC11 Unit I	1. History and milestones in Microbiology a. Spontaneous generation vs biogenesis
5	2	7		
Month: July			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11 Unit I	a. Contributions of scientists in Microbiology
Month: August			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11 Unit I	2. Classification of organisms Whittaker's and Carl Woese's classification
Month: September			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11 Unit I	3. Beneficial and harmful activities of Microorganisms
Month: October			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11 Unit I	4. Bacterial systematic a. Taxonomic ranks b. Bacterial nomenclature


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Academic Year: 2024-2025

Semester: B.Sc I Sem II

Department: Microbiology

Subject: Microbiology

Course Title: Basic Biochemistry

Name of the teacher: Mr. Suraj D. Gabale

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC21 Unit II	BIOMOLECULES A) Carbohydrates 1. Monosachharides 2. Disaccharides
5	2	7		
Month: December			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC21 Unit II	3. Disachharides 4. Polysachharides
Month: January			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC21 Unit II	B) Lipids 1. Simples lipds: Fats, oils and waxes
Month: February			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC21 Unit II	2. Compound lipids: Phopspholipids, glycolipids
Month: March			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC21 Unit II	C) Nucleic acids DNA: structure and function
Month: April			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC21 Unit II	C) Nucleic acids RNA: structure and function


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Academic Year: 2024-2025

Semester: B.Sc II Sem III

Department: Microbiology

Subject: Microbiology

Course Title: Industrial and applied Microbiology

Name of the teacher: Mr. Suraj D. Gabale

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC31 Unit II	A] Bioinstrumentation: Principle, working and application of- i) UV-visible spectrophotometer.
6	2	8		
Month: July			Module/Unit:	Sub-units planned
6	2	8		Principle, construction and working of Electrophoresis (Agarose gel, PAGE)
Month: August			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC31 Unit II	C] Biostatistics: i) Introduction ii) Data presentation iii) Central tendency : iv) Applications.
Month: September			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC31 Unit II	D] Bioinformatics: i) Introduction of basic terminologies- Applications of bioinformatics.
Month: October			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC31 Unit II	A] Air Microbiology: i) Sources of microorganisms in air. ii) Definitions of-a) Infectious dust, Droplets, Droplet nuclei iii) Sampling methods for microbial examination of air

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Academic Year: 2024-2025

Semester: B.Sc II Sem IV

Department: Microbiology

Subject: Microbiology

Course Title: Immunology and Medical Microbiology

Name of the teacher: Mr. Suraj D. Gabale

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC41 Unit II	Immunology 1. Immunity Definition, Types
6	2	8		
Month: December			Module/Unit:	Sub-units planned
6	2	8		2. Non-specific defense mechanism a. First line of defence b. Second line of defence
Month: January			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC41 Unit II	3. Antigens 4. Antibodies Structure and types
Month: February			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC41 Unit II	5. Theories of antibody production 6. Mechanism of Ag-Ab reaction
Month: March			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC41 Unit II	7. Types of Ag-Ab reactions 8. Types of immune response
Month: April			Module/Unit:	Sub-units planned
6	2	8	DSC03MIC41 Unit II	9. Immune response 10. Organs of Immune system

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Academic Year: 2024-2025

Semester: B.Sc III Sem V

Department: Microbiology

Subject: Microbiology

Course Title: Immunology and Clinical Microbiology

Name of the teacher: Mr. Suraj D. Gabale

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC1010E2	1. <i>Mycobacterium leprae</i>
1	4	16	Unit I	2. <i>Clostridium perfringenes</i>
				3. <i>Treponema pallidum</i>
Month: July			Module/Unit:	Sub-units planned
12	4	16	DSC1010E2	1. <i>Pseudomonas aeruginosa</i>
			Unit I	2. <i>Vibrio choleare</i>
				3. <i>Helicobacter pylori</i>
				4. <i>Leptospira interrogans</i>
Month: August			Module/Unit:	Sub-units planned
12	4	16	DSC1010E2	1. <i>Plasmodium falciparum</i>
			Unit II	2. <i>Candida albicans</i>
				3. Dengue virus
				4. Hepatitis A and B virus
				5. Rabies virus
				6. SARS virus
Month: September			Module/Unit:	Sub-units planned
12	4	16	DSC1010E2	1. Chemotherapy
			Unit II	2. Gene therapy
				3. Antimicrobial chemoprphylaxis
Month: October			Module/Unit:	Sub-units planned
12	4	16	DSC1010E2	4. Drug resistance
			Unit II	5. Vaccines

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Annual Teaching Plan

Academic Year: 2024-2025

Semester: B.Sc III Sem VI

Department: Microbiology

Subject: Microbiology

Course Title: Virology and Microbial Genetics

Name of the teacher: Mr. Suraj D. Gabale

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC1010F2 Unit I	1.General characteristics of Viruses 2. One step growth experiment 3. Viroids and Prions 5. Capsid, envelope and nucleic acid
12	4	16		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC1010F2 Unit I	1. Isolation and cultivation of- Bacteriophage, Animal & Plant viruses 2. Enumeration of viruses 3. Purification of viruses
12	4	16		
Month: January			Module/Unit:	Sub-units planned
12	4	16	DSC1010F2 Unit II	Multiplicatuion cycles of- a. Adenoviruses b. TMV
Month: February			Module/Unit:	Sub-units planned
12	4	16	DSC1010F2 Unit II	c. Lambada phage d. T4 bacteriophage
Month: March			Module/Unit:	Sub-units planned
12	4	16	DSC1010F2 Unit II	2. Types of cancer 3. Oncogenic viruses
Month: April			Module/Unit:	Sub-units planned
12	4	16	DSC1010F2 Unit II	4. Hypothesis about cancer

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Annual Teaching Plan

Academic Year: 2024-2025

Semester: B.Sc I Sem I

Department: Microbiology

Subject: Microbiology

Course Title: Introduction to microbiology

Name of the teacher: Ms. S. A.Pise

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC11: Unit II	Bacterial cell organization 1.Cell size,shape & arrangement 2.Cytology of bacteria a.cell wall b.cell membrane
5	2	7		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03MIC11: Unit II	c.capsule & slime layer d.flagella & pili
5	2	7		
Month: August			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11: Unit II	e.Ribosomes f.Mesosomes
Month: September			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11: Unit II	g.Inclusion bodies h.Nucleoid,chromosome & plasmid i.Endospore
Month : October			Module/Unit:	Sub-units planned
5	2	7	DSC03MIC11: Unit II	3.reserved food material a.nitrogenous b.non-nitrogenous


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Academic Year: 2024-2025

Semester: B.Sc I Sem II

Department: Microbiology

Subject: Microbiology

Course Title: Basic biochemistry

Name of the teacher: Ms. S. A.Pise

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC 03MIC21 Unit 1	Protein 1.Introduction to amino acids & peptide bonds
5	2	7		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC 03MIC21 Unit 1	2.Types of Amino acids based on R group
5	2	7		
Month: January			Module/Unit:	Sub-units planned
5	2	7	DSC 03MIC21 Unit 1	3.Structural levels of proteins
Month: February			Module/Unit:	Sub-units planned
5	2	7	DSC 03MIC21 Unit 1	Enzyme 1.Defination & types of enzymes
Month : March			Module/Unit:	Sub-units planned
5	2	7	DSC 03MIC21 Unit 1	2.Concept of apoenzyme,coenzyme,cofactor & active site
Month : April			Module/Unit:	Sub-units planned
5	2	7	DSC 03MIC21 Unit 1	3.Mechanism of enzyme action

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Academic Year: 2024-2025

Semester: B.Sc II Sem:III


Department: Microbiology

Subject: Microbiology

Course Title: Microbial Physiology

Name of the teacher: Ms. S.A.Pise

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03 MIC32 Unit II	A] Catabolism of glucose- EMP, HMP
6	2	8		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC03 MIC32 Unit II	A] Catabolism of glucose – ED and TCA cycle.
6	2	8		
Month: August			Module/Unit:	Sub-units planned
6	2	8	DSC03 MIC32 Unit II	B] Fermentation:- Homolactic & Heterolactic fermentation
Month: September			Module/Unit:	Sub-units planned
6	2	8	DSC03 MIC32 Unit II	C]Bacterial electron transport chain – Components, flow of electrons &
Month: October			Module/Unit:	Sub-units planned
6	2	8	DSC03 MIC32 Unit II	Mechanism of ATP generation– Chemiosmotic hypothesis


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Academic Year: 2024-2025

Semester: B.Sc II Sem IV

Department: Microbiology

Subject: Microbiology

Course Title: Microbial Genetics - I

Name of the teacher: Ms. S.A.Pise

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC 03 MIC 41	A.gene transfer in bacteria
6	2	8	Unit II	i.Fate of exogenote
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSC 03 MIC 41	ii.Modes of gene transfer
6	2	8	Unit II	a.transformation
				b.Conjugation
Month: January			Module/Unit:	Sub-units planned
6	2	8	DSC 03 MIC 41	c.Transduction
			Unit II	
Month: February			Module/Unit:	Sub-units planned
6	2	8	DSC 03 MIC 41	b.DNA repair
			Unit II	i.Photo reactivation
				ii.Dark repair mechanism
Month: March			Module/Unit:	Sub-units planned
6	2	8	DSC 03 MIC 41	c.Plasmid
			Unit II	i)Natural-Properties, types, structure & applications
Month: April			Module/Unit:	Sub-units planned
6	2	8	DSC 03 MIC 41	ii)Artificial -pBR 322- structure and applications
			Unit II	


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Academic Year: 2024-2025

Semester: B.Sc III Sem V

Department: Microbiology

Subject: Microbiology

Course Title: Industrial microbiology and microbial biochemistry

Name of the teacher: Ms. S. A.Pise

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper XII Unit I	a. Definition, properties, structure, specificity, classification and mechanism of action b. Allosteric enzymes c. Ribozymes d Isozymes
12	4	16		
Month: July			Module/Unit:	Sub-units planned
12	4	16	Paper XII Unit I	e. Factors affecting catalytic efficiency of enzymes f. Enzyme kinetics g. Regulation of enzyme synthesis.
Month: August			Module/Unit:	Sub-units planned
12	4	16	Paper XII Unit I	1. Extraction & purification of enzymes. 2. Assay of enzymes - 3. Immobilization of enzymes 4. Confirmation of purified enzymes
Month : September			Module/Unit:	Sub-units planned
12	4	16	Paper XII Unit II	1. Basic concepts of- a. Glyoxylate bypass b. Phosphoketolase pathway c. Bioluminescence 2. Assimilation of - a. Carbon, b. Nitrogen c. Sulphur
Month: October			Module/Unit:	Sub-units planned
12	4	16	Paper XII Unit II	3. Prokaryotic Biosynthesis of - a. RNA, b. DNA, c. Proteins ,d. Peptidoglycan

S.A.Pise
Ms. S.A.Pise



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Academic Year: 2024-2025

Semester: B.Sc III Sem VI

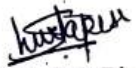
Department: Microbiology

Subject: Microbiology

Course Title: Agricultural and Environmental microbiology

Name of the teacher: Ms. S. A.Pise

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper VIII Unit I	1. Soil Microbiology. 2. Role of microorganisms in elemental cycle
12	4	16		
Month: December			Module/Unit:	Sub-units planned
12	4	16	Paper VIII Unit I	1. Manure and Compost
Month: January			Module/Unit:	Sub-units planned
12	4	16	Paper VIII Unit I	1. Types, production, methods of application and uses.- a. Biofertilizer b. Biopesticides
Month: March			Module/Unit:	Sub-units planned
12	4	16	Paper VIII Unit II	1. Biodegradation by bacteria & fungi 2. Plant Pathology – a. Common symptoms produced by plant pathogens b. Modes of transmission of plant disease
Month : April			Module/Unit:	Sub-units planned
12	4	16	Paper VIII Unit II	3. Plant Pathology c. Plant diseases- i. Citrus Canker ii. Tikka disease of groundnut iii. Bacterial Blight of Pomegranate. iv. Control of plant disease caused by bacteria.


Ms. S.A.Pise




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Month: September				
12	8	20	Unit I	Industrial Microbiology a. Strain Improvement b. Scale up of fermentations Practical I -: Immunology and Medical Microbiology 1. Isolation of <i>Candida albicans</i> from clinical samples (wherever possible) and identification of the same by morphological, cultural and biochemical characteristics
Month: October			Module/Unit:	Sub-units planned
12	8	20	Unit I	c. Microbiological assays d. Preservation of industrially important microorganisms - Methods, Culture collection centres.

M. Nadkarni

Ms. Mitali M. Nadkarni



G. K. Sontakke

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024 -25 **Semester:** VI (B.Sc. III) **Department:** Microbiology

Subject: Microbiology **Course Title:** PAPER VIII DSE:1010F2 Environmental Microbiology

Name of the teacher – Ms. Mitali M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	1.General characteristics of waste a. Liquid waste - pH, electrical conductivity, COD, BOD, total solids, total dissolved solids, total suspended solids, total volatile solids, chlorides, sulphates, oil & grease
12	8	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	1. General characteristics of waste b. Solid waste- pH, electrical conductivity, total volatile solids, ash. c. Standards as per MPCB Practical I - : Immunology and Medical Microbiology 2. Determination of MIC of streptomycin against <i>E. coli</i> by broth method
12	8	20		
Month: January			Module/Unit:	Sub-units planned
12	8	20	Unit I	2.Sewage Microbiology a. Physico-chemical and Biological characteristics 3. Treatment methods- 1. Physical treatment: Screening, Sedimentation Practical I - : Immunology and Medical Microbiology Urine analysis a. Physical and chemical examination of urine. b. Test for protein (Acetic acid test) c. Test for ketone bodies (Rothra's test) d. Test for bile salt.



Month: February				
12	8	20	Unit I	Treatment methods- 2. Biological treatment: Trickling filter, Activated sludge process, Oxidation ponds, Anaerobic digestion (Bio methanation), Septic tank. 3. Chemical treatment – Chlorination
Month: March			Module/Unit:	Sub-units planned
12	8	20	Unit I	3.Characteristics of waste generated by: a. Sugar Industry b. Dairy Industry 4.Characteristics and treatment of waste generated by Hospitals
Month: April			Module/Unit:	Sub-units planned
12	8	20	Unit I	Eutrophication a. Classification of lakes b. Sources c. Consequences d. Control

Mitali M. Nadkarni

Ms. Mitali M. Nadkarni



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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024 -25 **Semester:** III (B. Sc. II) **Department:** Microbiology

Subject: Microbiology **Course Title:** Paper V DSC03MIC31: Applied Microbiology – I

Name of the teacher – Ms. Mitali M. Nadkarni

Month: June			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	A. Water Microbiology: 1. Sources of microorganisms in water. 2. Faecal pollution of water. 3. Indicators of faecal pollution
12	8	20		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	4. Routine Bacteriological analysis of water. a. SPC b. Tests for Coli forms i) Qualitative test Detection of coliforms • Presumptive test, • Confirmed Test • Completed test. • Differentiation between coliforms – IMViC test. Eijkman test. ii) Quantitative test – • MPN • Membrane filter technique Practical 1. Effect of environmental factor on microorganisms: (i) Temperature (ii) pH (iii) Heavy metals – Copper (v) Salt (NaCl)
12	8	20		
Month: August			Module/Unit:	Sub-units planned
12	8	20	Unit I	5. Municipal water purification process and its significance. B. Food Microbiology a) Principles of microbial spoilage of food b) Spoilage of fruits, breads and meat Practical 2. Primary Screening of- Antibiotic producers–crowded plate technique.



				(ii) Amylase producers. 3. Determination of growth phases of <i>E. coli</i> by Optical density. 4. Study of diauxic growth
Month: September				
12	8	20	Unit I	c) General principles and methods of food preservation i) Asepsis ii) Removal of microorganism – trimming, filtration, centrifugation Practical 5. Biostatistics 6. Micrometry. 7. Stains and staining procedures: i) Spore staining ii) Flagella staining iii) Nucleus staining
Month: October			Module/Unit:	Sub-units planned
12	8	20	Unit I	iii) Dehydration method iv) Irradiation v) Anaerobiosis Practical Biochemical tests: (i) Gelatin hydrolysis test. (ii) Amino acid decarboxylation test (iii) Amino acid deamination test (iv) Arginine hydrolysis test

M. Nadkarni

Ms. Mitali M. Nadkarni



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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024 -25

Semester: IV (B. Sc II)

Department: Microbiology

Subject: Microbiology

Course Title: PAPER VII DSC03 MIC41: Medical Microbiology -I

Name of the teacher – Ms. Mitali M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	A] Definitions– Host, Parasite, Saprophytes, Commensal, Infection, Etiological agent, Disease, Pathogen, Opportunistic pathogen, True pathogen, Virulence, Pathogenicity, Fomite, Incubation period, Carriers, Morbidity rate, Mortality rate, epidemiology, etiology, Prophylaxis, Antigen, Antibody, Hapten, Vaccine, Immunity Practical (v) Urea hydrolysis test (vi) Nitrate reduction test (vii) Hugh and Leifson's test (viii) Oxidase test
12	8	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	B] Virulence factors–production of endotoxins, exotoxins, enzymes, ability to escape from phagocytosis. C] Types of infections– Chronic, acute, primary, secondary, reinfection, Iatrogenic, congenital, local, generalized, Covert, Overt, Simple, Mixed, Endogenous, Exogenous, Latent, Pyogenic, Nosocomial Practical (ix) Lecithinase test (x) Coagulase test 3. Isolation and identification of pathogenic microorganisms from clinical sample. (a) <i>Salmonella species</i> (b) <i>S. aureus</i>
12	8	20		
Month: January			Module/Unit:	Sub-units planned
12	8	20	Unit I	D] Types of diseases– I) Epidemic–e.g. Influenza, Cholera II) Endemic–E.g. Common cold, Typhoid III) Pandemic–E.g. SARS, Corona



				IV) Sporadic-E.g. Polio Practical: 3. Isolation and identification of pathogenic microorganisms from clinical sample. (c) Proteus species 4. Determination of Blood groups - ABO and Rh. 5. Serological tests- WIDAL test-qualitative slide test.
Month: February				
12	8	20	Unit I	E] Modes of transmission of diseases i) Air-borne transmission. ii) Vehicle transmission iii) Contact transmission iv) Vector borne transmission Practical: 1. Preparation of media: Tripart sugar iron agar, Gelatin agar, Amino acid decarboxylation medium, Amino acid deamination
Month: March			Module/Unit:	Sub-units planned
12	8	20	Unit I	F] General principles of prevention and control of microbial diseases. G] Normal flora of human body & its significance - (flora of skin, throat, GI tract & Urinogenital tract). Practical: Preparation of media: Arginine broth, Christensen's medium, Peptone nitrate broth, Hugh and Leifson's medium, Egg-Yolk agar, Mannitol salt agar.
Month: April			Module/Unit:	Sub-units planned
			Unit I	i) Beneficial and harmful aspects of normal flora ii) Concept of antibiosis

Mitali M. Nadkarni

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024-25

Semester: I (B.Sc. I)

Department: Microbiology

Subject: Microbiology Course Title: DSC03MIC12 Paper II Bacteriology

Name of the teacher: Ms. S. S. Shaikh

Month: JULY			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	Control of Microorganisms 1. Definitions 2. Mode of action and application of a) Physical agents: (i) Temperature (ii) Dessication
4	0	4		
Month: AUGUST			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	a) Physical agents (iii) Ultrasonication (iv) Radiations (v) Filtration b) Chemical agents: (i) Phenol and phenolic compounds (ii) Alcohols
4	0	4		
Month: SEPTEMBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	b) Chemical agents: (iii) Halogen compounds (iv) Heavy metals
4	0	4		
Month: OCTOBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	b) Chemical agents: (v) Fumigation by gaseous agents (vi) Osmotic Pressure
4	0	4		

Miss. Saniya S. Shaikh

Saniya S. Shaikh



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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024-25

Semester: II (B.Sc. I)

Department: Microbiology

Subject: Microbiology Course Title: DSC03MIC2... Paper II Bacteriology

Name of the teacher: Ms. S.S. Shaikh

Month: DECEMBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	A. Enrichment and isolation of micro organisms from natural environment 1. Pure culture techniques 2. Isolation and cultivation of anaerobic organisms by using media components and by exclusion of air
4	0	4		
Month: JANUARY			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	B. Preservation of microbial cultures: 1. Subculturing 2. Overlaying cultures with mineral oil 3. Storage at low temperatures 4. Lyophilization
4	0	4		
Month: FEBRUARY			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	C. Systematic study of pure culture 1. Morphological Characteristics 2. Cultural Characteristics
4	0	4		
Month: MARCH			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper II Unit II	3. Biochemical Characteristics 4. Serological characters 3. Concept of Culture collection centre
4	0	4		

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024-25

Semester: I (B. Sc .I)

Department: Microbiology

Subject: Microbiology Course Title: Paper I and II Practical Course

Name of the teacher: Ms. S.S. Shaikh

Month: AUGUST			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	1.. Preparations of a) stains (0.5% basic fuchsin, 0.5% crystal violet), b) Reagents (phosphate buffer of pH 7, 1 N and 1M solutions of HCL and NaOH 2.. 2. Biosafety a) Table disinfection, b) hand wash, c) use of aprons d) proper disposal of used material, e) Aseptic techniques, f) Cleaning and sterilization of glasswares
0	32	32		
Month: SEPTEMBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	3. Study of Laboratory instruments used in the microbiology laboratory: a) Laminar air flow b) autoclave, incubator c) hot air oven d) colorimeter e) colony counter f) bacteriological filter assembly 4. Study of compound microscope. 5. Microscopic observation of bacteria: a) Monochrome staining, b) Negative staining, c) Gram's staining, d) motility by Hanging-drop method. e) Cell wall staining (Chance's method), f) Capsule staining (Manuval's method), g) Volutine granule staining (Albert' s method) h) Demonstration of Acid –Fast staining
0	32	32		
Month: OCTOBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	6. Preparation of liquid and solid culture media-. a) agar plates b) slants c) Peptone water d) nutrient broth e) nutrient agar f) Sabourauds agar 30 g) Potato Dextrose agar h) Glucose yeast extract agar; i) MacConkey's agar . 7. Preparation of solid and liquid medium and assuring its sterility by autoclave and hot air oven. 8. Sterilization of glassware using Hot Air Oven and assessment for sterility 9. Fungal Mounting- Penicillium and Aspergillus 10. Personal hygiene Demonstration of presence of bacteria from hands, teeth and skin
0	32	32		



				(swabbing) by cultivation methods. 11. Detection of enzyme production ability of bacteria - i) Amylase ii) Catalase iii) Caseinase
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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024 -25 **Semester:** V (B.Sc. III) **Department:** Microbiology

Subject: Microbiology **Course Title:** PAPER XI DSE:1010E3Industrial Microbiology


Name of the teacher – Ms. S.S. Shaikh

Month: JULY			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit II	1. Industrial production of - a. Amylase production b. Grape wine Production
12	8	20		
Month: AUGUST			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	c. Penicillin production d. Citric acid production e. SCP by using yeast
12	8	20		
Month: SEPTEMBER			Module/Unit:	Sub-units planned
12	8	20	Unit II	2. Microbial production of a. Vitamins b. Amino acids 3.Probiotics
Month: OCTOBER			Module/Unit:	Sub-units planned
12	8	20	Unit II	4.Downstream processing and Product Recovery 5. Testing of sterility, pyrogen, carcinogenicity, toxicity and allergens

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024 -25
Microbiology

Semester: VI (B.Sc. III)

Department:

Subject: Microbiology
Microbiology

Course Title: PAPER VIII DSE:1010F2Environmental

Name of the teacher – Ms. S.S. Shaikh

Month: NOVEMBER			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	1.General characteristics of waste a. Liquid waste - pH, electrical conductivity, COD, BOD, total solids, total dissolved solids, total suspended solids, total volatile solids, chlorides, sulphates, oil & grease
12	8	20		
Month: DECEMBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	1. General characteristics of waste b. Solid waste- pH, electrical conductivity, total volatile solids, ash. c. Standards as per MPCB
12	8	20		
Month: JANUARY			Module/Unit:	Sub-units planned
12	8	20	Unit I	2.Sewage Microbiology a. Physico-chemical and Biological characteristics 3. Treatment methods- 1. Physical treatment: Screening, Sedimentation
Month: FEBRUARY			Module/Unit:	Sub-units planned
12	8	20	Unit I	Treatment methods- 2. Biological treatment: Trickling filter, Activated sludge process, Oxidation ponds, Anaerobic digestion (Bio methanation), Septic tank. 3. Chemical treatment – Chlorination
Month: MARCH			Module/Unit:	Sub-units planned
12	8	20	Unit I	3.Characteristics of waste generated by: a. Sugar Industry b. Dairy Industry 4.Characteristics and treatment of waste generated by Hospitals
Month: APRIL			Module/Unit:	Sub-units planned



12	8	20	Unit I	Eutrophication a. Classification of lakes b. Sources c. Consequences d. Control
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Department of Microbiology

Annual Teaching Plan

Academic Year: 2024-25
Microbiology

Semester: V and VI (B.Sc. III)

Department:

Subject: Microbiology Course Title: Paper IX and X Practical Course

Name of the teacher: Ms. S.S. Shaikh

Month: JULY			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper IX and X Practical Course	1. Determination of sensitivity of common pathogens to antibiotics by paper disc method
0	32	32		
Month: AUGUST			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	2. Serological tests: a) Widal test- Quantitative b) Demonstration of ELISA
0	32	32		
Month: SEPTEMBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	3. Hematology a) Estimation of Haemoglobin by Sahli's method b) Determination of ESR of blood sample c) Determination of PCV d) Total and differential blood cells count
0	32	32		
Month: OCTOBER			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper I and II Practical Course	6. Isolation of actinomycetes from soil by slide culture technique
0	32	32		

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