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- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 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	16	20		
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	16	20		
Month: **SEPTEMBER**			Module/Unit:	Sub-units planned
4	16	20	Paper II Unit II	b) Chemical agents: (iii) Halogen compounds (iv) Heavy metals

Month: **OCTOBER**	Module/Unit:	Sub-units planned

4	16	20	Paper II Unit II	b) Chemical agents: (v) Fumigation by gaseous agents (vi) Osmotic Pressure

Ms. S. S. Shaikh
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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: II (B.Sc. I) Department: Microbiology

Subject: Microbiology Course Title: DSC03MIC22: Microbial Nutrition and Techniques

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

Month: **DECEMBER**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper IV 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	16	20		
Month: **JANUARY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper IV Unit II	B. Preservation of microbial cultures by – 1.Subculturing, 2.overlaying cultures with mineral oils 3. storage at low temperature, 4. Lyophilization.
4	16	20		
Month: **FEBRUARY**			Module/Unit:	Sub-units planned
4	16	20	Paper IV Unit II	C. Systematic study of pure cultures: 1.Morphological characteristics. 2.Cultural characteristics – Colony characteristics on solid media, growth in liquid media. 3.Biochemical Characteristics - i) Sugar fermentation ii) H2S gas production iii)Detection of enzyme activity –

				Amylase Caseinase Catalase
Month: **MARCH**			Module/Unit:	Sub-units planned
4	16	20	Paper IV Unit II	4. Serological characters 3. Concept of Culture collection centres.

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: III (B.Sc. II) Department: Microbiology

Subject: Microbiology Course Title: 2DSC03MIC31 : Applied Microbiology - I

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

Month: **JULY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper V Unit I	Industrial Microbiology A. Basic concepts of fermentation. 1. Definition, concept of primary and secondary metabolites 2. Types of fermentations – Batch, continuous, dual and multiple.
4	32	36		
Month: **AUGUST**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper V Unit I	3. Typical Fermenter design – Parts and their functions. 4. Factors affecting fermentation process. B. Fermentation Media: A. Water, carbon source, nitrogen source, precursors, growth factors, antifoam agents, chelating agents. B. Use of wastes as Fermentation media – Molasses, sulphite waste liquor & corn steep liquor.
4	32	36		
Month: **SEPTEMBER**			Module/Unit:	Sub-units planned
4	32	36	Paper V Unit I	C. Screening of industrially important microorganisms. 1. Primary Screening of: Antibiotic producers, Organic acid producers and Amylase producers 2. Secondary screening
Month: **OCTOBER**			Module/Unit:	Sub-units planned

4	32	36	Paper V Unit IV	A. Bioinstrumentation: Principle, working and application of- A. Electrophoresis (Agarose gel, PAGE) B. U.V. –visible spectrophotometer. B. Bioinformatics: 1. Introduction of basic terminologies-Database, Genomics and Proteomics. 2. Applications of bioinformatics. C. Space Microbiology: Introduction & application D. Gnotobiology: Introduction

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Annual Teaching Plan

Academic Year: 2025-26 Semester: IV (B.Sc. II) Department: Microbiology

Subject: Microbiology Course Title: 2 DSC03 MIC 41: Medical Microbiology

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

Month: **DECEMBER**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper VII Unit III	A. Immunity: 1. Definition 2. Innate Immunity-types, factors influencing innate immunity 3. Acquired Immunity– Active & passive
4	32	36		
Month: **JANUARY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper VII Unit III	B. Non Specific defense mechanisms of the vertebrate body 1. First line of defense 2. Second line of defense C. Organs of Immune system- Types of Primary and secondary lymphoid organs
4	32	36		
Month: **FEBRUARY**			Module/Unit:	Sub-units planned
4	32	36	Paper VII Unit IV	A. Antigen-Chemical nature, types of antigens, factors affecting antigenicity. B. Antibody-Structure, properties and functions, types of antibodies. C. Theories of antibody production.

Month: **MARCH**			Module/Unit:	Sub-units planned
4	32	36	Paper VII Unit IV	D. Mechanism of antigen–antibody reaction–Lattice hypothesis. E. Types of antigen antibody reaction-Agglutination & Precipitation. F. Immune Response: Primary and secondary immune responses.

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: V (B.Sc. III) Department: Microbiology

Subject: Microbiology Course Title: DSE-I DSE03MIC51 Food and Industrial Microbiology

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

Month: **JULY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSE-I Unit-I	a. Food as a substrate for microorganisms. b. Food borne diseases – i. Role of microorganisms in food borne diseases ii. Food poisoning - i) Staphylococcal ii) Fungal (aflatoxin) iii. Food infections – Salmonellosis. iv. Food spoilage and its causes v. General principles of food preservation
8	16	24		
Month: **AUGUST**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	DSE-I Unit-II	2. Industrial Microbiology a. Strain Improvement b. Scale up of fermentations c. Microbiological assays d. Preservation of industrially important microorganisms- Methods. Culture collection centres.
8	16	24		
Month: **SEPTEMBER**			Module/Unit:	Sub-units planned
8	16	24	DSE-I Unit-III	1. Industrial production of - a. Amylase - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery. b. Grape wine - Definition, types, production of table wine (Red

				and White), microbial defects of wine c. Penicillin - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery. Concept of semi synthetic penicillin d. Citric acid - Organisms used, Inoculum preparation, Fermentation media, Fermentation conditions, Extraction and Recovery. e. SCP by using yeast

Month: **OCTOBER**			Module/Unit:	Sub-units planned
8	16	24	DSE-I Unit IV	2. Microbial Production of – a. Vitamins - Vit. B 12 b. Amino acids – Lysine 3. Probiotics 4. Downstream processing & product recovery - a. Centrifugation b. Flocculation c. Filtration d. Solvent extraction e. Distillation f. Precipitation g. Crystallization h. Chromatography. 5. Testing of sterility, pyrogen, carcinogenicity, toxicity and Allergens

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Annual Teaching Plan

Academic Year: 2025-26 Semester: V (B.Sc. III) Department: Microbiology

Subject: Microbiology Course Title: DSE-PR-V DSE03MIC59 Food and Industrial Microbiology

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

Month: **JULY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		1. Isolation of lactic acid bacteria from fermented food. 2. Examination of milk by Direct microscopic count (DMC) 3.Amylase production by using Bacillus species.
8	16	24		
Month: **AUGUST**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		1.Citric acid fermentation and recovery. 2. Estimation of citric acid by titration. 3.Isolation and detection of aflatoxins from given food sample.
8	16	24		
Month: **SEPTEMBER**			Module/Unit:	Sub-units planned
8	16	24		1. Production of wine. 2. Examination of wine for pH, color and alcohol content. 3.Determination of microflora of vegetables and fruits.

Month: **OCTOBER**	Module/Unit:	Sub-units planned

8	16	24		1.Detection for the presence of yeast and mold from given sample. 2. Sterility testing of pharmaceutical product. 3. Rapid detection of food pathogens (E. coli &: Staphylococcus) from given food sample 4.. Sauerkraut production.

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Annual Teaching Plan

Academic Year: 2025-26 Semester: VI (B.Sc. III) Department: Microbiology

Subject: Microbiology Course Title: DSC XIII DSC03MIC69 Microbial Biochemistry

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

Month: **DECEMBER**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper-XIII Unit-I	1. Enzymes - a. Definition, properties, structure, specificity, classification and mechanism of action (Lock & Key, Induced fit hypothesis) b. Allosteric enzymes - Definition, properties, models explaining mechanism of action. c. Ribozymes –concept, significance. d. Isozymes- definition, properties, example.
8	16	24		
Month: **JANUARY**				
Lectures	Practicals	Total	Paper-XIII Unit-II	e. Factors affecting catalytic efficiency of enzymes i. Proximity and orientation ii. Strain and distortion. iii. Acid base catalysis iv. Covalent catalysis f. Enzyme kinetics - Derivation of Michaelis-Menten equation, Lineweaver Burk Plot, Significance of Km & Vmax. g. Regulation of enzyme synthesis. i. Positive control - Ara operon ii. Negative control - Lac operon iii. Catabolite repression
8	16	24		
Month: **FEBRUARY**				

8	16	24	Paper-XIII Unit-III	1.. Extraction & purification of enzymes. a. Methods of extraction of intracellular and extracellular enzymes. i. Choice of source and biomass development ii. Methods of homogenization - cell disruption methods iii. Purification of enzymes on the basis of - 1. Molecular size 2. Solubility differences 3. Electrical charge 4. Adsorption characteristic differences 2. Assay of enzymes - Based on substrate and product estimation. 3. Immobilization of enzymes - Methods & applications 4. Confirmation of purified enzymes
Month: **MARCH**			Module/Unit:	Sub-units planned
8	16	24	Paper-XIII UnitIV	1. Basic concepts of - a. Glyoxylate bypass b. Phosphoketolase pathway c. Bioluminescence – Occurrence, mechanism and applications. 2. Assimilation of - a. Carbon b. Nitrogen with respect to N 2 and NH 3 (GOGAT) c. Sulphur 1. Prokaryotic Biosynthesis of - a. RNA b. DNA c. Proteins d. Peptidoglycan

Shaikh

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: V (B.Sc. III) Department: Microbiology

Subject: Microbiology Course Title: DSC-PR-VI DSC03MIC69 MICROBIAL BIOCHEMISTRY

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

Month: **JULY**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		Assay of amylase by DNSA method. Immobilization of enzymes by sodium alginate method. Detection of enzyme activity of salivary amylase.
8	16	24		
Month: **AUGUST**			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		Effect of temperature on enzyme activity of alpha-amylase. Effect of pH on enzyme activity of alpha-amylase.
8	16	24		
Month: **SEPTEMBER**			Module/Unit:	Sub-units planned
8	16	24		Determination of enzyme activity of amyloglucosidase enzyme. Effect of activators and inhibitors on enzyme activity

Month: **OCTOBER**			Module/Unit:	Sub-units planned
8	16	24		Protein purification by using ammonium sulfate precipitation. Sepration and detection of amino acids by TLC.

Ms. S. S. Shaikh
Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

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Annual Teaching Plan

Academic Year: 2025-2026 **Semester**: B.Sc. I Sem I

Department: Microbiology **Subject**: Microbiology

Course Title: PAPER I 2DSC03MIC11: Introduction to Microbiology

Name of the Teacher: Ms. M. M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	1. Spontaneous generation *vs.* biogenesis. 2.Contributions of scientist **Practical**: DSC MICRO PR-I Microbiology Lab-I
4	16	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	3. Classification of microorganisms– 4.Taxonomic ranks **Practical**: DSC MICRO PR-I Microbiology Lab-I
4	16	20		
Month: January			Module/Unit:	Sub-units planned
4	16	20	Unit I	Beneficial and harmful activities of microorganisms **Practical**: DSC MICRO PR-I Microbiology Lab-I
Month: February				
4	16	20	Unit II	**Unit-2: Types of Microorganisms** **1.General characteristics of different groups:** a) Acellular microorganisms- Viruses, Viroid, Prions **Practical**: DSC MICRO PR-I Microbiology Lab-I
Month: March			Module/Unit:	Sub-units planned
4	16	20	Unit I	b) Cellular microorganisms- with emphasis on distribution, occurrence and morphology. Bacteria, Fungi, Algae & Protozoa **Practical**: DSC MICRO PR-I Microbiology Lab-I
Month: April			Module/Unit:	Sub-units planned
4	16	20	Unit I	i) Beneficial and harmful aspects of normal flora ii) Concept of antibiosis

Madkarni

Ms. M. M. Nadkarni

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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Annual Teaching Plan

Academic Year: 2025-2026 **Semester**: B.Sc. I Sem II

Department: Microbiology **Subject**: Microbiology

Course Title: 2DSC03MIC22: Microbial Nutrition and Techniques

Name of the Teacher: Ms. M. M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	**A] Microbial Nutrition**
4	16	20		1.Nutritional requirements of microorganisms.
				Practical: DSC MICRO PR-I Microbiology Lab-II
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	**A] Microbial Nutrition**
4	16	20		2. Nutritional types of microorganism based on carbon and energy sources.
				Practical: DSC MICRO PR-I Microbiology Lab-II
Month: January			Module/Unit:	Sub-units planned
4	16	20	Unit II	A. Culture media
				1.Components of media
				Practical: DSC MICRO PR-I Microbiology Lab-II
Month: February				
4	16	20	Unit I	A. Culture media
				2.Types of media based on- Physical state
				Practical: DSC MICRO PR-I Microbiology Lab-II
Month: March			Module/Unit:	Sub-units planned
4	16	20	Unit I	B. Culture media
				2.Types of media based on- Chemical nature
				Practical: DSC MICRO PR-I Microbiology Lab-II
Month: April			Module/Unit:	Sub-units planned
4	16	20	Unit I	**Cultivation of microorganisms**

Nadkarni

Ms. M. M. Nadkarni

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Annual Teaching Plan

Academic Year: 2025-2026 **Semester:** B.Sc. II Sem III

Department: Microbiology **Subject:** Microbiology

Course Title: Paper V DSC03MIC31: Applied Microbiology – I

Name of the Teacher: Ms. M. M. Nadkarni

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	1. Sources of microorganisms in water. 2. Fecal pollution of water. 3. Indicators of fecal pollution. **Practical** DSC – PR- III lab 3 2VSC 03 MIC 39 Analytical Microbiology
4	32	36		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	4. Routine Bacteriological analysis of water. a. SPC b. Tests for Coli forms i) Qualitative test Detection of coliforms **Practical** DSC – PR- III lab 3 2VSC 03 MIC 39 Analytical Microbiology
4	32	36		
Month: August			Module/Unit:	Sub-units planned
4	32	36	Unit II	b. Tests for Coli forms ii) Quantitative test – 5. Municipal water purification process and its significance. **Practical** DSC – PR- III lab 3 2VSC 03 MIC 39 Analytical Microbiology
Month: September			Module/Unit:	Sub-units planned
4	32	36	Unit III	Air Microbiology a. Source of microorganism b. Definitions of: Infectious dust, Droplets **Practical** DSC – PR- III lab 3 2VSC 03 MIC 39 Analytical Microbiology
Month: October			Module/Unit:	Sub-units planned
4	32	36	Unit III	c. Sampling methods for microbial examination of air

Nadkarni

Ms. M. M. Nadkarni

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Academic Year: 2025-2026 **Semester**: B.Sc. II Sem IV

Department: Microbiology **Subject**: Microbiology

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

Name of the Teacher: Ms. M. M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	A] Definitions– Host, Parasite, Saprophytes, Commensal, Infection, Etiological agent, Disease & etc. **Practical**: DSC – PR- III lab 4 VSC 03 MIC 49 Microbial analysis of air and water
4	32	36		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	B] Virulence factors- C]Types of infections **Practical**: DSC – PR- III lab 4 VSC 03 MIC 49 Microbial analysis of air and water
4	32	36		
Month: January			Module/Unit:	Sub-units planned
4	32	36	Unit I	D] Types of diseases–Epidemic, Endemic Pandemic & Sporadic **Practical**: DSC – PR- III lab 4 VSC 03 MIC 49 Microbial analysis of air and water
Month: February				
4	32	36	Unit I	E] Modes of transmission of diseases: Air-borne Vehicle Contact & Vector borne **Practical**: DSC – PR- III lab 4 VSC 03 MIC 49 Microbial analysis of air and water
Month: March			Module/Unit:	Sub-units planned
4	32	36	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**: DSC – PR- III lab 4 VSC 03 MIC 49 Microbial analysis of air and water
Month: April			Module/Unit:	Sub-units planned
4	32	36	Unit I	i) Beneficial and harmful aspects of normal flora ii) Concept of antibiosis

Ms. M. M. Nadkarni

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Annual Teaching Plan

Academic Year: 2025-2026 **Semester**: B.Sc. III Sem V

Department: Microbiology **Subject**: Microbiology

Course Title: DSC-XI DSC03MIC53 Agriculture microbiology

Name of the Teacher: Ms. M. M. Nadkarni

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Paper **XI** Unit I	1. Soil Microbiology. 2. Role of microorganisms inelemental cycle **Practical V Section III -: Agriculture Microbiology**
8	16	24		
Month: July			Module/Unit:	Sub-units planned
8	16	24	Paper **XI** Unit II & III	1. Manure and Compost Unit III 1.Types, production, methods of application and uses- a. Biofertilizer **Practical V Section III -: Agriculture Microbiology**
Month: August			Module/Unit:	Sub-units planned
8	16	24	Paper **XI** Unit III	Unit III 1.Types, production, methods of application and uses- b. Biopesticides 2. Biodegradation by bacteria & fungi- a. Cellulose b. Pesticides **Practical V Section III -: Agriculture Microbiology**
Month: September			Module/Unit:	Sub-units planned
8	16	24	Paper **XI** Unit IV	Plant Pathology – a. Common symptoms produced by plant pathogens b. Modes of transmission of plant disease

				c. Plant diseases– i. Citrus Canker ii. Tikka disease ofgroundnut **Practical V Section III -: Agriculture Microbiology**
Month: October			Module/Unit:	Sub-units planned
8	16	24	Paper **XI** Unit IV	c. Plant diseases– iii. Bacterial Blight of Pomegranate. iv. Control of plant disease caused by bacteria. **Practical V Section III -: Agriculture Microbiology**

Ms. M. M. Nadkarni

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Annual Teaching Plan

Academic Year: 2025-2026 **Semester**: B.Sc. III Sem VI

Department: Microbiology **Subject**: Microbiology

Course Title: DSE-II DSE03MIC61 Environmental Microbiology

Name of the Teacher: Ms. M. M. Nadkarni

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	1.**General characteristics of waste-** a. Liquid waste. b. Solid waste c. Standards as per MPCB **2. Eutrophication** **DSE Practical II -: Environmental microbiology**
8	16	24		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	**1.Sewage Microbiology** a. Physico-chemical and biological characteristics b. Treatment methods- i. Physical treatment ii. Biological treatment iii. Chemical treatment – Chlorination **DSE Practical II -: Environmental microbiology**
8	16	24		
Month: January			Module/Unit:	Sub-units planned
8	16	24	Unit II & Unit III	**2. Characteristics and treatment of waste generated by** a. Sugar industry b. Dairy industry c. Hospitals **Unit III** **1. Biological safety in laboratory** a. Good Laboratory Practices b. Bio safety levels (BSL) 2. **Environmental monitoring** a. Definition and purpose b. Cleanroom **DSE Practical II -: Environmental microbiology**

Month: February				
8	16	24	Unit III	c. Routine Environmental monitoring programme in pharmaceutical industries- d. Routine Environmental monitoring programme in pharmaceutical industries **3. Environmental Impact Assessment** **DSE Practical II -: Environmental microbiology**
Month: March			Module/Unit:	Sub-units planned
8	16	24	Unit IV	**1. Bioremediation** i. Definition ii. Types iii. Applications. **2. Bioleaching**. Introduction, Microorganisms involved, Chemistry of Microbial leaching, Laboratory scale and pilot scale leaching **DSE Practical II -: Environmental microbiology**
Month: April			Module/Unit:	Sub-units planned
8	16	24	Unit IV	**2. Bioleaching** In situ leaching - Slope, heap & Leaching of Copper and Uranium

Ms. M. M. Nadkarni

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: I (B.Sc.I) Department: Microbiology

Subject: Microbiology Course Title: 2DSC 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 Practical Course I
4	16	20		
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 Practical Course I
4	16	20		
Month : August			Module/Unit:	
4	16	20	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				
4	16	20	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				
4	16	20	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

Ms.Vrushali V.Misal

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 Semester: II (B.Sc.I) Department: Microbiology

Subject: Microbiology Course Title: 2DSC03MIC22 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. Practical course II
4	16	20		
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. Practical course II
4	16	20		
Month : January			Module/Unit:	
4	16	20	Unit I	**B. Culture Media :** i) Components of Media Practical course II
Month : February				
4	16	20	Unit I	ii)Types of Media based on – Physical state Chemical nature Function Practical course II
Month : March				
4	16	20		**C. Cultivation of Microorganisms** i) Use of culture media for cultivation Practical course II
Month : April				
4	16	20		ii) Conditions required for growth of Microorganisms Practical course II

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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:** 2DSC03MIC32: 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 Practical course III
4	16	20		
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 Practical course III
4	16	20		
Month : September			Module/Unit:	
4	16	20	Paper III Sec II, Unit IV	pH- Neutrophiles, Acidophiles and Alkalophiles Osmotic pressure – Isotonic, environments, hypotonic and hypertonic xerophiles and halophiles Practical course III
Month : October				
4	16	20	Paper III Sec II, Unit IV	C]Transport across cell membrane– Diffusion, active transport and group translocation. Practical course III

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 **Semester:** IV (B.Sc.II) **Department:** Microbiology

Subject: Microbiology **Course Title:** 2 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
4	16	20		
Month : January				
Lectures	Practicals	Total	Paper VII Unit I	2. Forms of DNA. 3. Genetic code – 4.Organization of chromosomal DNA in *E.Coli* Practical IV
4	16	20		
Month : February				
4	16	20	Paper VII Unit I	B. Mutation i) Basic concept of mutation ii) Spontaneous mutation Practical IV
Month : March				
4	16	20	Paper VII Unit I	Mutagens that distort DNA a) acridine dyes Practical IV
Month : April				
4	16	20	Paper VII Unit I	b) UV Light

Ms.Vrushali V.Misal

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 **Semester :** V (B.Sc.III) **Department:** Microbiology

Subject: Microbiology **Course Title:** DSC03 MIC : 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.Hematapoiesis-characteristics & types of stem cells. b.Classification of cells of immune system . c. Structure & function of lymphoid cells d. Structure & function of myeloid cells Practical Course V Sec I
08	16	24		
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 V Sec I
08	16	24		
Month : August			Module/Unit:	Sub-units planned
08	16	24	Unit II	2 .Cytokines 3. Immunological tolerance : 4 . Interferon 1. Complement Practical Course V Sec I
Month : September				
08	16	24	Unit III	2.Monoclonal antibodies 1.New diagnostic techniques 2.Hypersensitivity Practical Course V Sec I
Month : October				
08	16	24	Unit IV	3.Autoimmunedisease Practical Course V Sec I

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** I (B.Sc. I) **Department:** Microbiology

Subject: Microbiology **Course Title**: DSC-I 2DSC03MIC11

Name of the teacher – Ms. Pratibha P. Patil

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	**1. Cell size -** Unit of measurement **Shape** – cocci, bacilli, spirilla, vibrio, spirochete **Arrangement** Practical course - DSC-I 2DSC03MIC11
12	8	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	**2. Reserve food materials–** a) Nitrogenous b) Non-nitrogenous Practical course - DSC-I 2DSC03MIC11
12	8	20		
Month: January			Module/Unit:	Sub-units planned
12	8	20	Unit I	**3. Structure and Function of-** a) Cell-wall b) Cell membrane Practical course - DSC-I 2DSC03MIC11
Month: February				Sub-units planned
12	8	20	Unit I	**3. Structure and Function of-** c) Capsule and slime layer. d)Flagella and Pili Practical course - DSC-I 2DSC03MIC11
Month: March			Module/Unit:	Sub-units planned
12	8	20	Unit I	**3. Structure and Function of-** e) Ribosomes f) Mesosomes g) Inclusion bodies Practical course - DSC-I 2DSC03MIC11
Month: April			Module/Unit:	Sub-units planned
12	8	20	Unit I	**3. Structure and Function of-** h) Nucleoid, chromosome and plasmids i) Endospore Practical course - DSC-I 2DSC03MIC11

Ms. Pratibha P. Patil

PPatil

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** IV (B. Sc. II) **Department:** Microbiology

Subject: Microbiology **Course Title:** 2 DSC03 MIC 42 :Microbial Genetics - I

Name of the teacher – Ms. Pratibha P. Patil

Month: June			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit III	1. Fate of exogenote in recipient cell Practical course - 2 DSC03 MIC 42 :Microbial Genetics-I VSC-PR-II 2VSC03MIC39
16	4	20		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit III	**2. Modes of gene transfer–** a) Transformation. b) Conjugation c) Transduction Practical course-2 DSC03 MIC 42 :Microbial Genetics-I VSC-PR-II 2VSC03MIC39
16	4	20		
Month: August			Module/Unit:	Sub-units planned
16	4	20	Unit IV	A. DNA repair : 1. Photo reactivation Mechanism of Photoreactivation, role of photolyase Practical course-2 DSC03 MIC 42 :Microbial Genetics- I VSC-PR-II 2VSC03MIC39
Month: September				Sub-units planned
16	4	20	Unit IV	2. Dark repair mechanism (Excision repair) Practical course - 2 DSC03 MIC 42 :Microbial Genetics-I VSC-PR-II 2VSC03MIC39
Month: October			Module/Unit:	Sub-units planned
16	4	20	Unit IV	**B. Plasmids–** 1. Natural–Properties, types, structure & applications 2. Artificial -pBR 322- structure and applications Practical course -2 DSC03 MIC 42 :Microbial Genetics-I VSC-PR-II 2VSC03MIC39

Ms. Pratibha P. Patil

PPPatil

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** V (B. Sc. III) **Department:** Microbiology

Subject: Microbiology **Course Title**: DSC X DSC02MIC52 VIROLOGY

Name of the teacher – Ms. Pratibha P. Patil

Month: June			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	**1. Structural properties of viruses** Structure of T4, HIV and TMV. Nucleic acid and Envelope **Practical course -** DSC X DSC02MIC52 VIROLOGY
16	8	24		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	b. structure of viroid and prion c. One step growth experiment **Practical course -** DSC X DSC02MIC52 VIROLOGY
16	8	24		
Month: August			Module/Unit:	Sub-units planned
16	8	24	Unit II	**2. Isolation, cultivation and purification of viruses** **a. isolation and cultivation of viruses-** i. Animal virus- Tissue culture, chick embryo and live animals ii. Plant virus- protoplast culture technique, Insect tissue culture iii. Bacteriophages- plaque method. **Practical course -** DSC X DSC02MIC52 VIROLOGY
Month: September				
16	8	24	Unit II	**b. Purification of viruses using physico-chemical properties** i. Density gradient centrifugation ii. Precipitation **Practical course -** DSC X DSC02MIC52 VIROLOGY
Month: October			Module/Unit:	Sub-units planned
16	8	24	Unit II	**3. Methods of Enumeration of viruses** i. Latex droplet method (Direct microscopic count) ii . Plaque and pock method **Practical course -** DSC X DSC02MIC52 VIROLOGY

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** VI (B.Sc. III) **Department:** Microbiology

Subject: Microbiology **Course Title:** DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY

Name of the teacher – Ms. Pratibha P. Patil

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit I	1. Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – a. Mycobacterium leprae **Practical course** - DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY
32	4	36		
Month: December			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Unit I	Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – b. Clostridium perfringens **Practical course** - DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY
32	4	36		
Month: January			**Module/Unit:**	**Sub-units planned**
32	4	36	Unit I	Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – c. Treponema pallidum **Practical course** - DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY

Month: February				
32	4	36	Unit I	Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – a.Pseudomonas aeruginosa **Practical course -** DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY
Month: March			Module/Unit:	Sub-units planned
32	4	36	Unit I	Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – b. Vibrio cholera **Practical course -** DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY
Month: April			Module/Unit:	Sub-units planned
32	4	36	Unit I	Morphology, cultural and biochemical characteristics, antigenic structure, modes of transmission and pathogenesis, symptoms, laboratory diagnosis, prevention and control of diseases caused by – c. .Streptococcus mutans d.. Helicobacter pylori **Practical course -** DSC XIV DSC03MIC63 MEDICAL MICROBIOLOGY

Ms. Pratibha P. Patil

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** II (B.Sc I) **Department:** Microbiology

Subject: Microbiology **Course Title:** PAPER III DSC03MIC21: Basic Biochemistry

Name of the teacher – Ms. Apurva T. Patil

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit II	**A. Carbohydrates:** 1) Monosaccharides : Classification based on aldehyde and ketone groups; Structures of Ribose , Dextrose, Glucose and Fructose Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II
12	8	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit II	2) Disachharides : Glycosidic bond , structure of lactose and sucrose 3) Polysaccharides : Structure of starch , glycogen and cellulose Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II
12	8	20		
Month: January			Module/Unit:	Sub-units planned
12	8	20	Unit II	**B. Lipids:** 1) Simple lipids – Fats , oils, waxes 2) Compound lipids – Phospholipid, Glycolipid Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II
Month: February				
12	8	20	Unit II	3) derives lipids – Cholesterol **C. Nucleic Acids :** 1) DNA – Structure (Watson and Crick Model) and function Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II

Month: March			Module/Unit:	Sub-units planned
12	8	20	Unit I	2) RNA – Types (mRNA, tRNA, rRNA) structure, function Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II
Month: April			Module/Unit:	Sub-units planned
			Unit I	i) Beneficial and harmful aspects of normal flora ii) Concept of antibiosis Practical Course – DSC MICRO PR- I MICROBIOLOGY LAB II

Ms. Apurva T. Patil

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025-26 **Semester:**III (B. Sc. II) **Department:** Microbiology

Subject: Microbiology **Course Title**: Paper V 2DSC03MIC32 : Microbial Physiology

Name of the teacher – Ms. Apurva T. Patil

Month: June			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit III	**Catabolism of glucose-** A. EMP Practical Course - DSC- PR-III 2 DSC MIC 39 Microbiology Lab -3 2VSC II 2 VSC 03 MIC 39 Analytical Microbiology
12	8	20		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I	D. TCA cycle C. ED and Practical Course - DSC- PR-III 2 DSC MIC 39 Microbiology Lab -3 2VSC II 2 VSC 03 MIC 39 Analytical Microbiology
12	8	20		
Month: August			Module/Unit:	Sub-units planned
12	8	20	Unit III Unit IV	B. HMP **A.** Fermentation : Homolactic & Heterolactic fermentation Practical Course - DSC- PR-III 2 DSC MIC 39 Microbiology Lab -3 2VSC II 2 VSC 03 MIC 39 Analytical Microbiology
Month: September				
12	8	20	Unit I	B. Bacterial electron transport chain- Components , floe of electron & mechanism of ATP generation Practical Course - DSC- PR-III

				2 DSC MIC 39 Microbiology Lab -3 2VSC II 2 VSC 03 MIC 39 Analytical Microbiology
Month: October			Module/Unit:	Sub-units planned
12	8	20	Unit I	C. Chemiosmotic hypothesis Practical Course - DSC- PR-III 2 DSC MIC 39 Microbiology Lab -3 2VSC II 2 VSC 03 MIC 39 Analytical Microbiology

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Department of Microbiology

Annual Teaching Plan

Academic Year: 2025 -26 **Semester:**V (B.Sc.III) **Department:** Microbiology

Subject: Microbiology **Course Title**: Paper X DSC03MIC52: Virology

Name of the teacher – Ms. Apurva T. Patil

Month: June			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit III	4. Reproduction of T4 Bacteriophage 2.Reproduction of animal viruses - Adenovirus
12	8	20		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit III	3.Reproduction of plant viruses – TMV 1. Lysogeny – Definition of lysogeny and temperate phages, types , Lysogeny of lambda phage- adsorption & penetration ,genetic map for lysogenic interaction , expression of lambda genes , Practical Course – DSC-PR-V DSC03MIC59 DSC Microbiology Lab - V Section II - Virology
12	8	20		
Month: August			Module/Unit:	Sub-units planned
12	8	20	Unit III Unit IV	1. Lysogeny –establishment of repression, maintenance of repression, integration of lambda genome into host chromosome **Oncogenesis-** a. Definition of oncogenesis b. Types of cancer Practical Course – DSC-PR-V DSC03MIC59 DSC Microbiology Lab - V Section II - Virology
Month: September				

12	8	20	Unit IV	c. Characteristics of cancer cells d. Tumor suppressor genes and protooncogenes e. hypothesis about cancer – I. somatic Mutation Hypothesis II. Viral gene hypothesis i. Role of DNA viruses with special emphasis on Papova viruses Practical Course – DSC-PR-V DSC03MIC59 DSC Microbiology Lab - V Section II - Virology
Month: October			Module/Unit:	Sub-units planned
12	8	20	Unit I	ii. Role of RNA tumor virus iii. Provirus theory, Protovirus theory, III. Defective Immunity Hypothesis Practical Course – DSC-PR-V DSC03MIC59 DSC Microbiology Lab - V Section II - Virology

Ms. Apurva T. Patil

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Annual Teaching Plan

Academic Year: 2025 -26 **Semester:** VI (B.Sc. III) **Department:** Microbiology

Subject: Microbiology **Course Title**: PAPER XIV DSC03MIC63 : Medical Microbiology

Name of the teacher – Ms. Apurva T. Patil

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit III	1. Morphology, cultural and biochemical characteristics , antigenic structures, modes of transmission and pathogenesis, symptoms, laboratory, diagnosis, prevention and control of diseases caused by – a. Protozoa : *Plasmodium falciparum* (malaria) b. Virus : i) Hepatitis A & B Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology
12	8	20		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit III	ii) Rabies virus iii) Dengue Virus Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology
12	8	20		
Month: January			Module/Unit:	Sub-units planned
12	8	20	Unit III Unit IV	c. Fungi : *Candida albicans* 1. Chemotherapy a. General principals of chemotherapy b. Mode of action of Penicillin , streptomycin, Bacitracin, sulphonamide and quinolones on Microorganisms. Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology

Month: February				
12	8	20	Unit IV	c. Antiviral drugs :AZT d. Antifungal drugs : Ketoconazole e. Antiprotozoal Drugs : Metronidazole Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology
Month: March			Module/Unit:	Sub-units planned
12	8	20	Unit IV	f. Mechanism of drug resistance g. Chemoprophylaxis 2. Gene Therapy – Concept , advantages & disadvantages Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology
Month: April			Module/Unit:	Sub-units planned
12	8	20	Unit IV	3. Immunoprophylaxis- Vaccines and Immune sera a. Vaccines – live attenuated , heat killed , subunit , Conjugate and DNA vaccines b. Immune sera – examples with applications Practical Course – DSC-PR-VI DSC03MIC69 DSC Microbiology Lab - VI Section III – Medical Microbiology

Ms. Apurva T. Patil

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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