

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Microbiology (PG)
Academic Year 2025-26

Annual Teaching Plan

Academic Year: 2025-2026

Semester: M.Sc. I SemesterI

Department: Microbiology (PG)

Subject: Microbiology

Course Title: RMD20MIC11 - Research Methodology

Name of the teacher: Dr. K. K. Bhise

Month: June			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit I	Theory	Practicals
16	32	48		Fundamentals of Research methodology 1. Meaning 2. Research Approaches 3. Significance of Research 4. Research Methods versus Methodology	Practicals of Taxonomy and Microbial diversity Practicals of Genetics and Molecular Biology
Month: July			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit I	1. Research and Scientific Method 2. Criteria of Good Research 3. Hypothesis 4. Literature survey 5. Ethical issues and intellectual property rights 6. Publication process	Practicals of Taxonomy and Microbial diversity Practicals of Genetics and Molecular Biology
16	32	48			
Month: August			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit II	Interpretation and Report Writing 1. Technique of Interpretation 2. Significance of Report Writing 3. Mechanics of Writing a Research Report 4. Precautions for	Practicals of Taxonomy and Microbial diversity Practicals of Genetics and Molecular Biology



16	32	48		Writing Research Reports 5. Meaning and importance of workshop, seminar, conference 6. Plagiarism 7. Writing tools 8. Referencing and citation tools	
Month: September			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit III	Bioinformatics	
16	32	48		1. Components, objectives & databases 2. biological databases, types and examples 3. database management systems 4. Pattern matching and sequence alignment of nucleic acids and proteins 5. Database Search engines 6. Publishers in life Sciences	Practicals of Taxonomy and Microbial diversity Practicals of Genetics and Molecular Biology
Month: October			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit IV	Biostatistics	
16	32	48		1. Definitions of statistics and biostatistics, 2. population 3. sample 4. variable and the various types, statistic and parameter. 5. Collection and presentation of data 6. Measures of central tendency 7. Dispersion	Practicals of Taxonomy and Microbial diversity Practicals of Genetics and Molecular Biology

Dr. K. K. Bhise

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Dr. T. C. Gaupale
I/C Head

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Annual Teaching Plan

Academic Year: 2025-2026

Semester: M. Sc. II Semester III

Department: Microbiology (PG)

Subject: Microbiology

Course Title: DSC20MIC31-Agricultural Microbiology and Phytopathology

Name of the teacher: Dr. K. K. Bhise

Month: June			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total		Theory	Practicals
			Unit I	1. Scope and concept 2. Distribution of microorganisms	Practicals of Agricultural Microbiology and Phytopathology
16	16	32			
Month: July			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total			
			Unit I	1. Bio-geochemical cycles 2. Microflora of rhizosphere	
16	16	32	Unit II	1. Production of biofertilizers	
Month: August			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total			
			Unit II	1. Method of application 2. Green manure and composting 3. Development of genetically modified crop 4. Plant pathogen interaction	Practicals of Agricultural Microbiology and Phytopathology
16	16	32			
Month: September			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total			
			Unit III	1. Diseases caused by Bacteria	



16	16	32		<ol style="list-style-type: none"> 1. Diseases caused by Fungi 2. Biological control 3. Merits and demerits of biological control 	Practicals of Agricultural Microbiology and Phytopathology
Month: October			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit IV	<ol style="list-style-type: none"> 1. Parasitism and Disease 2. Host range of pathogens 3. Effect of pathogens on physiology of host 4. Defense Mechanisms of Plant 	Practicals of Agricultural Microbiology and Phytopathology
16	16	32			

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Academic Year: 2025-2026

Semester: M. Sc. I Semester II

Department: Microbiology (PG)

Subject: Microbiology

Course Title: DSE20MIC21-Medical Microbiology

Name of the teacher: Dr. K. K. Bhise

Month: November			Module/Unit:	Sub-units planned	
				Theory	Practicals
Lectures	Practicals	Total	Unit I	1. Virulence 2. Attributes of microorganisms that enable them to cause disease 3. Pathogen survival mechanisms 4. Collection and transport of clinical specimens	Practicals of Medical Microbiology Practicals of Techniques in Microbiology
16	32	48			
Month: December			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit II	1. Bacterial Diseases 2. Fungal Diseases	Practicals of Medical Microbiology Practicals of Techniques in Microbiology
16	32	48			
Month: January			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit III	1. Prevention and control of diseases caused by viruses 2. Diseases caused by Protozoa 3. Pathology of AIDS and prevalence of Tuberculosis, Mycoplasma and	Practicals of Medical Microbiology Practicals of Techniques in Microbiology
16	32	48			



				Cryptococcus infections	
				4. Special microbial metabolites and their applications in health care	
Month: February			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit IV	1. B and T cell immune deficiency disorders	Practicals of Medical Microbiology
16	32	48		2. Complement disorders: complement component deficiency	Practicals of Techniques in Microbiology
				3. Rheumatic disease	
				4. Atopic disease	

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Academic Year: 2025-2026

Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

Subject: Microbiology

Course Title: DSC20MIC42- Industrial Waste Management

Name of the teacher: Dr. K. K. Bhise

Month: November			Module/Unit:	Sub-units planned	
				Theory	Practicals
Lectures	Practicals	Total	Unit I	1. Types and Characterization of industrial wastes 2. Effects of industrial wastes on aquatic life	Practicals of Industrial waste management
16	16	32			
Month: December			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit I & II	1. Self-purification in natural waters 2. Microbiology and biochemistry of wastewater treatment	Practicals of Industrial waste management
16	16	32			
Month: January			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit II	1. Methods of industrial waste treatment 2. Physico chemical Methods	Practicals of Industrial waste management
16	16	32			
Month: February			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit III	1. Methods of industrial waste treatment: Part-II Biological methods - I	Practicals of Industrial waste management
16	16	32			



				2. Methods of industrial waste treatment: Part-III Biological methods - II	
Month: March			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit IV	1. Biomangement of industrial waste	Practicals of Industrial waste management
16	16	32			
Month: April			Module/Unit:	Sub-units planned	
Lectures	Practicals	Total	Unit IV	1. Methods of treatment of wastes from different industries 2. Zero waste discharge 3. Waste disposal control and regulations	Practicals of Industrial waste management
16	16	32			

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Semester: M.Sc. I Semester I
Department: Microbiology (PG)
Subject: Microbiology
Course Title: Immunology DSC20MIC12
Name of the teacher: Dr. S. D. Mali

Lectures	Practicals	Total	Module/Unit	Sub-units planned- Theory	Sub-units planned- Practicals
Month: June					
16	16	32	Unit I	1. MHC complex	Practicals of Immunology
Month: July					
16	16	32	Unit I	1. Signal transduction 2. T-cell sensitization	Practicals of Immunology
Month: August					
16	16	32	Unit II	1. Complement System 2. Genetics of Ab synthesis 3. Antibody diversity 4. Vaccines	Practicals of Immunology
Month: September					
16	16	32	Unit III	1. Transplantation immunology 2. Tumour immunology	Practicals of Immunology
Month: October					
16	16	32	Unit IV	1. Serodiagnosis of diseases 2. Immunochemical techniques 3. PCR based diagnostic tests	Practicals of Immunology

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Semester: M. Sc. I Semester II

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Microbial Physiology, Biochemistry & Metabolism DSC20MIC22

Name of the teacher: Dr. S. D. Mali

Lectures	Practicals	Total	Module/ Unit:	Sub-units planned-Theory	Sub-units planned- Practicals
Month: November					
16	16	32	Unit I	1. Carbohydrate metabolism 2. Oxidation of hydrocarbons	Practicals of Microbial Physiology, Biochemistry & Metabolism
Month: December					
16	16	32	Unit I	1. Oxidation of fatty acids & phospholipids 2. Catabolism of amino acids 3. Pasteur and Crabtree effect 4. Autotrophy	Practicals of Microbial Physiology, Biochemistry & Metabolism
Month: January					
16	16	32	Unit II	1. Carbohydrate metabolism 2. Oxidation of hydrocarbons 3. Oxidation of fatty acids & phospholipids 4. Catabolism of amino acids	Practicals of Microbial Physiology, Biochemistry & Metabolism
Month: February					
16	16	32	Unit II	1. Respiratory metabolism 2. Photo-phosphorylation 3. Drug metabolism in the body 4. Fermentation of bacteria	Practicals of Microbial Physiology, Biochemistry &

					Metabolism
Month: March					
16	16	32	Unit III	1. Protein chemistry 2. Biosynthesis of amino acids 3. Lipid metabolism 4. Phospholipid biosynthesis 5. Purine and pyrimidine Biosynthesis	Practicals of Microbial Physiology, Biochemistry & Metabolism
Month: April					
16	16	32	Unit IV	1. Osmosis 2. Permeation 3. Biosignaling 4. Microbial hormones and quorum sensing	Revision and journal checking

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Semester: M. Sc. II Semester III

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Enzymology & Enzyme Technology DSC20MIC32

Name of the teacher: Dr. S. D. Mali

Lectures	Practicals	Total	Module/ Unit:	Sub-units planned- Theory	Sub-units planned- Practicals
Month: June					
16	32	48	Unit I	1. History & properties of enzymes 2. Nomenclature & Classification of enzymes	Practicals of Enzymology and enzyme technology Practicals of Quality control Microbiology I
Month: July					
16	32	48	Unit I	1. Specificity of enzymes: 2. Structure of enzymes 3. Methods employed to identify functional groups in the active site 4. Catabolism of amino acids	Practicals of Enzymology and enzyme technology Practicals of Quality control Microbiology I
Month: August					

16	32	48	Unit II	1. Kinetics of single-substrate enzyme catalysed reactions 2. Kinetics of Multi substrate reactions 3. Haldane's relationship For reversible reactions 4. Sigmoid kinetics-Hill & Adair equations 5. Enzyme inhibition	Practicals of Enzymology and enzyme technology Practicals of Quality control Microbiology I
Month: September					
16	32	48	Unit III	1. Covalent modification of enzyme structure 2. Ligand induced changes 3. Multienzyme systems 4. Membrane bound Enzymes in metabolic regulation 5. Isoenzymes	Practicals of Enzymology and enzyme technology Practicals of Quality control Microbiology I
Month: October					
16	32	48	Unit IV	1. Applications of enzymes in medicine 2. Industrial applications of enzymes 3. Enzymes as analytical tools 4. Immobilisation of enzymes 5. Newer approaches to the Application of enzymes	Practicals of Enzymology and enzyme technology Practicals of Quality control Microbiology I

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Semester: M. Sc. II Semester IV

Department: Microbiology (PG)

Subject: Microbiology

Course Title: Food and Dairy Microbiology DSC20MIC41

Name of the teacher: Dr. S. D. Mali

Lectures	Practicals	Total	Module/ Unit:	Sub-units planned- Theory	Sub-units planned- Practicals
Month: November					
16	16	32	Unit I	1. Micro-organisms and Food Materials 2. General principles underlying microbial spoilage of food	Practicals of Food and Dairy Microbiology
Month: December					
16	16	32	Unit I	1. Microbial spoilage of cereal and cereal products 2. Microbial spoilage of sugar and sugar products 3. Microbial spoilage of heated canned food 4. General principles of Preservation of food 5. Methods of food preservation	Practicals of Food and Dairy Microbiology
Month: January					
16	16	32	Unit I	1. Milk: Definition, composition, Factors Affecting composition, Nutritive value of milk 2. Spoilage of milk and milk products	Practicals of Food and Dairy Microbiology

				3. Fermented foods	
Month: February					
16	16	32	Unit II	1. Food borne diseases 2. Prevention and control of food borne diseases 3. Fermented dairy products and their role in controlling food borne diseases	Practicals of Food and Dairy Microbiology
Month: March					
16	16	32	Unit III	1. Probiotics 2. Enzymes in food processing 3. Applications of enzymes 4. Food safety and standards	Practicals of Food and Dairy Microbiology
Month: April					
16	16	32	Unit IV	Revision and unit tests	Revision and journal checking

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